The Effects of Online Financial Endorsements on the Investment Behavior of Young Retail Investors

Peter de Goeij
Emre Kaan

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Affiliations

Peter de Goeij – Tilburg University

Emre Kaan – KPMG

Abstract

Online financial endorsements by influencers can assist investors in assessing the quality of potential investments. However, the effects of endorsements on investor behavior are insufficiently understood. In this paper we conduct an incentive-compatible survey with a sample of Tilburg University students to investigate, via different scenarios, the effects of online financial endorsements on different measures of investor behavior. These measures are (i) the willingness to invest, (ii) the amount invested in the financial product being endorsed, (iii) the perceived risk level, (iv) the inclination to consult other information sources before making an investment decision, and (v) the perceived reliability of the endorsement. We find that online financial influencers with a relatively high number of followers increase the perceived reliability of the endorsement by 28.7%. In addition, finfluencers claiming to be qualified to give financial advice decrease the perceived riskiness of the endorsement by 13.1%. Overall, we conclude, from our qualitative analysis of the reasons for respondents to not invest, that investors are hesitant to invest solely on the basis of online financial endorsements.

Samenvatting

Financiële aanbevelingen door online influencers kunnen consumenten helpen om een oordeel te vormen over de kwaliteit van investeringen. Het aanbevelingseffect van financiële influencers ("finfluencers") op het beleggingsgedrag van potentiële investeerders is echter nog niet uitvoerig onderzocht. In deze studie maken we gebruik van een 'incentive-compatible' vragenlijst-experiment, waarbij eerstejaars studenten als respondenten fungeren, om via verschillende scenario's te onderzoeken hoe de aanbevelingen van finfluencers verschillende maatstaven van beleggingsgedrag en perceptie beïnvloeden. Deze maatstaven zijn: (i) bereidheid om te investeren, (ii) de hoogte van het te investeren bedrag, (iii) het persoonlijk ervaren risiconiveau, (iv) de bereidheid om andere informatiebronnen te raadplegen en (v) de gepercipieerde betrouwbaarheid van de aanbeveling. De resultaten laten zien dat finfluencers met een relatief hoog aantal volgers het gepercipieerde vertrouwen in het financiële advies met 28,7% verhogen. Daarnaast is het zo dat finfluencers die beweren gekwalificeerd te zijn om financieel advies te geven, het gepercipieerde risiconiveau van het financiële aanbevelingen met 13,1% verlagen. Tenslotte, op basis van kwantitatieve analyse van redenen van respondenten om niet te investeren, concluderen we dat respondenten terughoudend zijn om alleen op basis van online financiële aanbevelingen een beleggingsbeslissing te nemen.

1. Introduction

As financial services are increasingly online, the barriers to start investing have lowered. Recent research by the Dutch Authority for the Financial Markets (AFM) shows that the number of Dutch households that engage in investing has increased in two years' time, between 2019 and 2021, from 1.6 million to 1.9 million (AFM trendzicht, 2022). Most investors choose for execution-only services (EO), which implies that the investor is personally responsible for his or her portfolio and investment decisions. It has been determined that 24% of execution-only investors[1] started investing in the past two years and that most of them do so to maintain or improve household wealth. Combined with the rise of social media, this has brought forth a new phenomenon: financial influencers, so-called finfluencers, who post messages on social media platforms about investing. To our knowledge no research yet exists on the effects of endorsements by finfluencers, and this study is meant to contribute to this literature.

Online financial endorsements are characterized by their limited information on the financial products being endorsed. We identify three factors that can help potential investors assess the endorsements. These are (i) the number of followers, (ii) whether the endorser is qualified to give financial advice, and (iii) evidence of self-interest about the financial product on the part of the influencer. In this paper we apply an experimental survey approach to investigate the effects of these factors on different measures of investor behavior. These measures are (i) the willingness-to-invest, (ii) the amount invested in the financial product being endorsed, (iii) the perceived riskiness, (iv) the inclination to consult other information sources before making an investment decision, and (v) the perceived reliability of the endorsement.

The target group of the experimental survey consists of young retail investors. That is because finfluencers seem to target a younger audience, and the outlets used by the finfluencers, such as Twitter, YouTube and Discord, are media outlets that are often used by the younger consumers. Moreover, finfluencers themselves are in many cases also young investors. This leads to the main research question of this paper: What are the effects of online financial endorsements on the investor behavior of young retail investors? This overriding question will be answered by examining four sub-questions on how investor behavior is affected by online financial endorsements, namely, how do they differ in (i) the number of followers, (ii) the claim to be qualified

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1   Nonprofessional investors who choose to invest and manage their portfolio without advice from a professional third-party.

to give financial advice, (iii) the disclosure of self-interest, and (iv) explicit inclusion in the endorsement of the word "risky" versus "safe".

As a first step, an analysis is conducted to determine how online financial endorsements are made. Based on real endorsements found in the supervisory file of the Dutch financial markets regulator AFM, we find that all endorsements lack informational content to enable making an investment decision. The endorsements contain attention-grabbing pictures and icons with high visual prominence. Next, we conduct a survey experiment in which the online endorsements vary in the four ways mentioned above. The experiment is designed in cooperation with the AFM. The respondents to the survey experiment are students of Tilburg University, who are included in the target group for online endorsers.

The findings are summarized as follows. First, we find that the treatment about the number of followers links up with a significant increase in the perceived reliability of the endorsement (+27.3%). Moreover, we find that an endorser claiming to be qualified to give personal financial advice links up with a significant decrease in the perceived riskiness of the endorsement. Nevertheless, we find no statistically significant result on the willingness-to-invest across all four treatments. The causality of these findings is established by randomized controlled trials, by randomly assigning respondents to a treatment or a control group.

We also investigate whether the effects of the treatments are affected by prior experience with online financial endorsements, financial literacy, risk-seeking behavior, and behavioral biases. These analyses reveal that financially literate respondents invest less in endorsements that differ in the number of followers and are more inclined to consult other information sources when faced with endorsements that differ in the claim of qualification. In addition, respondents who exhibit risk-seeking behavior invest on average more in endorsements that explicitly state that the endorsed financial product is "risky".

We believe that this paper is a first contribution to the literature that tests the effect of online financial endorsements on investment behavior. Because regulatory supervisors (such as the AFM in the Netherlands) have a prominent role in the financial markets, understanding the effects of this relatively new phenomenon on investor behavior is crucial. A survey experiment also allows for analysis at the individual investor level, as it allows correction for confounding factors. Nevertheless, the respondents in the survey experiment consist of a specific group, namely young university students who are perhaps representative for a group of investors who have little or no experience in investing, but who generally have had higher education.

As such, the findings of this paper can only be attributed to investors with similar characteristics as our respondents.

From a policy perspective, the findings provide insights for financial regulators. Our main policy advice would be to apply supervisory resources to endorsers who claim to have certain financial qualifications, especially those with a considerable number of followers. Our findings are also of interest to the pension industry. Although they do not state it as such, finfluencers to a certain extent provide financial information, or at least they are perceived to do so. Information disclosure is very important when making a financial decision. This is especially relevant for the many self-employed persons who invest in 'generic' investment products such as (index) mutual funds to save for their own pension. It is also relevant for consumers who save for their pension in a DC pension scheme and make personal investment decisions. Moreover, as mentioned above, the student respondent sample can be interpreted to act as a proxy for the large population of consumers who find it difficult to make personal financial decisions. These investors typically should seek financial advice from financial advisors, but since these are costly and the information of finfluencers is free, the findings of our study are also relevant for this group of consumers.

The remainder of this paper is organized as follows. Section 2 provides an overview of the literature and hypothesis development. That is followed by a discussion of the design of the study in Section 3. The empirical findings are contained in Section 4. Section 5 discusses the findings, and Section 6 states our conclusions.

2. Literature review, institutional framework and hypothesis development

To our knowledge, extensive academic literature on finfluencers does not exist. However, the AFM published a first exploratory study of approximately 150 financial influencers in December 2021 (AFM, 2021). This study was prompted by the fact that finfluencing is a relatively new and increasingly popular trend that is likely to affect investment decisions by mainly young and first-time investors. Over time, the AFM has received numerous questions and complaints about investment-related content on social media. The AFM has vocalized these concerns because the laws and regulations regarding online investment endorsements are not always complied with. While financial influencers provide easily accessible information about investing and thus might meet a need, nearly all of them operate in ways that involve risks.

One observation in the AFM study is that finfluencers provide investment advice to their followers without being licensed to do so. Relying on advice by unskilled endorsers may result in unsuitable investments that impede followers' interests. In addition, followers of finfluencers are usually not professional investors who invest by themselves without advice from a professional third-party. Social media is becoming increasingly important for investment decisions. According to studies by the AFM on investor behavior, ten percent of investors with no more than two years of investment experience mention that information or recommendations on social media played a role in their decision to start investing. Moreover, 9% of execution-only investors use social media or influencers as sources of information for investment decisions, and, when it comes to execution-only investors with no more than two years of investment experience, this applies to 15% (Consumentenmonitor AFM, 2021). Next to online investment advice, many consumers are nowadays faced with all sorts of potential fraud practices via social media or other digital communication platforms. For example, a popular scam is calling potential target consumers disguised as a representative of a helpdesk to prevent bank fraud. The scammer, acting as a bank employee, hopes to take over the computer or phone of the potential victim in order to transfer money to a scammer's bank account. Fraud via WhatsApp or Marktplaats is also very common.

Every year, the AFM identifies the principal trends and related risks that will impact the financial markets, in order to then further develop its supervisory agenda. Its most recent Trend Monitor 2022 mentions that social media can be used as a new

coordinating platform for market manipulation[2]. These studies show the increasing need to understand investors' behavior when faced with online financial endorsements. Relying on financial endorsements by finfluencers may give rise to irrational investment behavior manner. Such behavior counters traditional finance theory, which assumes that markets and investors are fully rational (Kumar & Goyal, 2015).

The efficient market hypothesis (EMH) assumes that security prices at all times fully reflect all available market information (Fama, 1969). The EHM fails, however, in understanding market anomalies and the human behavior involved in the investment decision-making process, and that has led to the evolution of the study of behavioral finance. Kahneman and Tversky (1982) were among the first to describe the behavioral biases that investors display in their investment decision process, relying on heuristics which often lead to sub-optimal investments. These biases are especially prevalent among retail investors, who tend to be less sophisticated than institutional investors. Studies by Tourani-Rad and Kirby (2005) and Nigam et al. (2018) observe that investors deviate from fully rational behavior when making financial decisions. Chater, Huck and Inderst (2010) provides similar conclusions, based on survey methodology.

Endorsement of products and services is a well-known concept in the field of marketing. Abbas et al. (2018) show the importance of celebrity endorsement on purchase intentions of customers for mobile phones. The purchase intention is affected by the likeability, attractiveness, and credibility of the endorser. Dwidienawati (2020) investigated the impact of customer review and influencer review on the purchase intention, showing that influencer review has a positive impact on the purchase intention, while customer review failed to show any real significance.

Since financial influencers mainly communicate by social media, it is relevant to review the literature on this form of media channel. De Vries et al. (2012) show that, the more followers or likes a social media account or post has, the higher its marketing effectiveness. A potential mechanism that explains a post's effectiveness is forming social proof by receivers. Social proof is the notion that individuals follow the opinions of the crowd. When many people like something, people infer that it should be good (Cialdini, 1987). Taillon et al. (2020) show that closeness positively moderates the effect of attractiveness on purchase intentions and moderates the effect of likeability on attitude toward an influencer. Collins and Feeney (2004) defined closeness as "the degree to which relationship partners are cognitively, emotionally and behaviorally interdependent with one another". Applied to the social media context,

2   For example, the U.S. authorities have recently charged eight social media influencers in a
    major stock fraud scheme (Reuters, 2022). See *https://www.reuters.com/legal/us-sec-charges-8-influencers-100-mln-stock-fraud-scheme-2022-12-14/*

this would mean that people use the numbers of followers or likes to make inferences about the popularity and quality of social media posts.

Research on endorsement marketing has identified two major processes that may underlie the effect of brand endorsement on advertising effectiveness: identification with the endorser (Basil, 1996) and perceived endorser credibility (Ohanian, 1991). Endorser credibility was assessed on a 7-point differential scale, ranging between unreliable and reliable.

The target group of finfluencers typically includes young potential retail investors who lack inexperience in making investment decisions. The role of age as a differentiating factor in the financial risk-taking behavior of retail investors is the factor investigated most often. Older individuals tend to be less risk-tolerant than younger individuals. A potential explanation for this is that older individuals have less time to meet their financial goals and objectives (Grable & Lytton, 1999a). In addition, finfluencers who recommend specific investments may have monetary incentives in doing so, impairing their objectivity. Campbell, DeAngelis and Moon (2019), in examining investor perceptions of the financial position of non-professional analysts who provide stock analyses on SeekingAlpha, a social media outlet, find that investors perceive non-professional analysts to be more credible when they hold positions in the firms about which they write.

The vast majority of finfluencers lack verifiable education related to investments, nor do they have work experience in the field of investments. Agnew et al. (2018) demonstrate the effect of adviser credentials on adviser choice, finding that participants in their experiment preferred advice from advisers who display a credential, regardless of the participant's personal characteristics and the quality of the advice.

Existing literature has assessed the effects of endorsements posted on social media on purchase intentions, but to the best of our knowledge there is no empirical work that analyses the impact of endorsements by financial influencers on individual investor behavior. This study contributes to the literature on the following four dimensions: (1) analyzing the effects of the number of followers of the endorser, (2) disclosing the endorser's stock ownership, (3) disclosing the endorser's qualification to give financial advice, and (4) disclosing the risk factor of an endorsement on individual investor behavior.

2.1 Institutional framework

This section describes the regulatory background which online financial endorsers must comply with. The institutional framework focuses on the Dutch market, which is embedded in European legislation. Relevant for our research is the Market Abuse

Regulation (MAR). The AFM is the designated supervisory authority to ensure compliance with MAR on Dutch territory. Social media posts may contain investment recommendations which need to be compliant with this regulation.

Article 3, paragraph 1, point 35 of the MAR, defines an investment recommendation as:

"... (1) information recommending or suggesting an investment strategy, explicitly or implicitly, (2) concerning one or several financial instruments or the issuers, including any opinion as to the present or future value or price of such investments, (3) intended for distribution channels or for the public."
(Regulation (EU) No. 596/2014 on market abuse, 2014)

All three components, which are detailed below, must be met.

(1) "'Information recommending or suggesting an investment strategy' means information (i) produced by an independent analyst, an investment firm, a credit institution, any other person whose main business is to produce investment recommendations, or a natural person working for them under a contract of employment or otherwise, which, directly or indirectly, expresses a particular investment proposal in respect of a financial instrument or an issuer; or (ii) produced by persons other than those referred to in point (i), which directly proposes a particular investment decision in respect of a financial instrument. Based on a Q&A session of the European Securities and Market Authority (ESMA), it is stated that 'any communication containing purely factual information on one or several financial instruments or issuers would not constitute an investment recommendation under MAR provided that it does not explicitly or implicitly recommend or suggest an investment strategy.'" (Questions and Answers on the Market Abuse Regulation (MAR), 2021).

(2) "'Concerning one or several financial instruments or the issuers including any opinion as to the present or future value or price of such investments', for the definition of financial instruments a reference is made to MiFID II, Annex I Section C." The most relevant definition in the context of this thesis is that financial instruments are all transferable securities.

(3) 'Intended for distribution channels or for the public' is not defined in MAR. ESMA's final report on MAR provides the following definition of a distribution channel': "a channel through which information is, or is likely to become, publicly available. 'Likely to become publicly available information' shall mean information to which a large number of persons have access". ESMA has chosen not to quantify what constitutes 'a large number of persons' (European Securities and Markets Authority, 2015).

Additionally, whenever investment recommendations are made, a number of transparency requirements must be met. Article 20, paragraph 1 of the MAR mentions that:

> *"Persons who produce or disseminate investment recommendations or other information recommending or suggesting an investment strategy shall take reasonable care to ensure that such information is objectively presented, and to disclose their interests or indicate conflicts of interests concerning the financial instruments to which that information relates."*
>
> *(Article 20, paragraph 1 of MAR)*

In The Netherlands, online financial endorsements are governed by MAR. It is the AFM's responsibility to supervise finfluencers.

2.2 Hypothesis development

To answer the research question in this study, we test four hypotheses. First, we expect that a higher number of followers provides social proof. The effect of social proof is expected to have a negative effect on the perceived riskiness, a positive effect on the willingness-to-invest, as well as on the specific amounts invested, but a priori it is not clear what the effect is on the intention to search for additional information. If an investor believes that an endorsement by a financial influencer with a great number of followers is sufficient for an investment decision, then it is expected that the investor may require less additional information, resulting in a negative effect on the intention to search for additional information. However, relying only on financial endorsements is a mental shortcut that applies only a limited amount of information. A rational investor would still require information additional to the endorsement.

A study by Saima and Khan (2020) examined the effect of social media influencers on the purchase intentions of consumers and the mediating role of credibility. Ohanian (1990) has suggested that in the context of celebrity endorsement, credibility consists of expertise, trustworthiness, and attractiveness. We use the measure of reliability as a proxy of credibility. We expect that the social proof, qualification, and stock ownership positively impact the perceived reliability. A priori it is not clear how the riskiness affects perceived reliability. This leads us to formulate the following hypothesis:

Hypothesis 1: Social proof, measured by the number of followers, (a) decreases perceived riskiness, (b) increases willingness-to-invest, (c) increases the average amount invested, (d) ambiguously affects the intention to search for additional information, and (e) increases perceived reliability.

Next, we examine the effect of an endorser's qualification to give investment advice on the i behavior of investors. Perceived source credibility becomes an

increasingly important variable within social media (Westerman, Spence & Van der Heide, 2014). We expect that an endorser's qualification to give financial advice is a signal of competency. The study by Lin, Spence and Lachlan (2016) examined credibility indicators on social media and found that participants view authority cues as most credible. Consequently, we expect that disclosure of the qualification to give investment advice signals competency, which is interpreted as an authority cue. This argument leads us to formulate the second hypothesis as follows:

Hypothesis 2: Disclosing the qualification to give investment advice (a) decreases perceived riskiness, (b) increases the willingness-to-invest, (c) increases the average amount invested, (d) ambiguously affects the intention to search for additional information, and (e) increases perceived reliability.

Third, we examine how disclosing the stock ownership of the endorser affects investors. Although regulations (such as MAR) require the disclosure in a financial endorsement of any incentive that impairs objectivity to be included (e.g. disclosing the ownership of a stock being endorsed), this information is often not shown. One could argue that ownership of stocks endorsed by a finfluencers is a potential conflict of interest that can compromise the finfluencer's objectivity and lead overly optimistic recommendations that hurt investors. Yet proponents of a finfluencers' stock ownership argue that owning stocks that are endorsed enhances the credibility of the finfluencers' recommendations since they put their money where their mouths are, having skin in the game. Based on the work of Campbell et al. (2019), disclosure of stock ownership could be a signal of the endorsement being credible. Moreover, analysts who own stocks in a company that they follow make more informative recommendations and exert more effort in covering the company, as shown by Chan, Lin, Yu & Zhao (2018). However, their study also finds that analysts with stock ownership issue more optimistic target price forecasts. Additionally, they find that the majority of analysts who own stock terminate their position when they have a buy recommendation outstanding. These findings imply that analysts' stock ownership induces them to bias their forecasts, but also suggest that stock ownership enhances the credibility of their recommendations by conveying their superior information.

Hence, the effect of disclosing ownership of a stock that is endorsed by financial influencers is expected to have no clear effect a priori on perceived riskiness, willingness-to-invest, specific amounts invested, and intention to search for additional information. This leads us to formulate the third set of hypotheses as follows:

Hypothesis 3: Disclosing stock ownership (a) ambiguously affects perceived riskiness, (b) ambiguously affects the willingness-to-invest, (c) ambiguously affects

Table 1 – Summary overview of the hypotheses

	Willingness-to-invest	Amount invested	Riskiness	Consult other information	Reliability
Social Proof	+	+	–	+/–	+
Qualification	+	+	–	+/–	+
Ownership	+/–	+/–	+/–	+/–	+/–
Risky	+/–	+/–	+	+/–	+/–

This table gives a summary of the expected coefficient signs.

the average amount invested, (d) ambiguously affects the intention to search for additional information, and (e) increases perceived reliability.

Finally, we examine how risk factor disclosure affects investors' behavior, by including the word "risky" or "safe" in endorsements. Although regulations require risk information to be included in endorsements on social media, this information is often left out. We expect that risky (or safe) endorsements, by including the word "risky" (or "safe"), increases (or decreases) perceived riskiness (Cox & de Goeij, 2020). According to Kannadhasan (2015), it is reasonable to assume that age has an inverse relationship with risk tolerance because younger individuals have more time to accumulate wealth and to recover financial losses. However, the target group has a higher chance of experiencing financial difficulty when financial assets deteriorate, due to the lack of a financial buffer, so they may then invest in a risk-averse manner. We expect that including the word "risky" or "safe" ambiguously affects the willingness-to-invest, the average amount invested, and the intention to search for additional information. Therefore, we formulate the hypothesis as follows:

Hypothesis 4: Explicit risk disclosure by including the word "risky" ("or safe") in endorsements (a) increases (or decreases) perceived riskiness, (b) ambiguously affects the willingness-to-invest, (c) ambiguously affects the average amount invested, (d) ambiguously affects the intention to search for additional information, and (e) ambiguously affects the perceived reliability.

We examine these hypotheses by conducting a survey experiment. We aim to maximize the external validity of this approach through random assignment of respondents and the development of realistic treatments. A more extensive discussion of the external validity of the findings is included in the discussion section. Table 1 shows a summary of the hypotheses with the expected coefficient sign. If no clear positive or negative relationship is to be expected, the empirical study should tell us, in our sample, which direction the relationship goes. Section 3 discusses the design of the experimental setup.

3. Research design

In this section we discuss the design of the survey experiment (3.1) and the online financial endorsements depicted in (3.2).

3.1 Design of the survey experiment

The survey was administered online between April 28 and May 20, 2022 to Tilburg University students. The survey was distributed to first year students in Bachelor Economics and Business Economics, Business Economics, Fiscal Economics, International Business Administration, and Master Finance. Respondents received a monetary compensation of €2.50 for their participation in the study. The question‐ naire was conducted using Qualtrics software. To ensure a proper sample size among treatments, respondents were randomly assigned without replacement to one of the four endorsements. We imposed no restrictions on the time that respondents could spend reading the endorsement, and we measured the viewing time from the moment respondents began the experiment. Moreover, respondents were able to browse forward and backward. This approach might stimulate look‐up behavior or changes to initial answers. However, the look‐up behavior is limited as company names are anonymized. To keep the experiment as close to reality as possible, respondents were able to reconsult the endorsements.

Respondents first participate in the experiment. They read a brief introductory text and then begin a two‐round experiment. In the first round, the Social Proof and Qualification endorsements are tested. Respondents view either the control or treatment version of one of the two endorsements. Hence, half of the respondents participate in the Social Proof test and the others in the Qualification test, to test hypothesis sets 1 and 2.

After seeing the endorsement, respondents must answer five questions, measur‐ ing (i) willingness‐to‐invest, (ii) amount invested out of 2,500 experimental euros (reflecting their €2.50 participation fee, but multiplied by 1,000 to mimic more closely a potential real‐life investment size; they therefore invest with the participation fee they own if they complete the survey), (iii) perceived riskiness of the investment endorsement, (iv) inclination to search for other information, and (v) perceived reliability (the full questionnaire is contained in the Appendix). The question formats and measurement scales are adopted from Miyazaki and Krishnamurthy (2002) and from Aydogdu and Wellman (2011). The willingness‐to‐invest is measured as a binary option: participants either willing to invest (answering "yes") or not (answering "no")

Figure 1 – Experimental setup
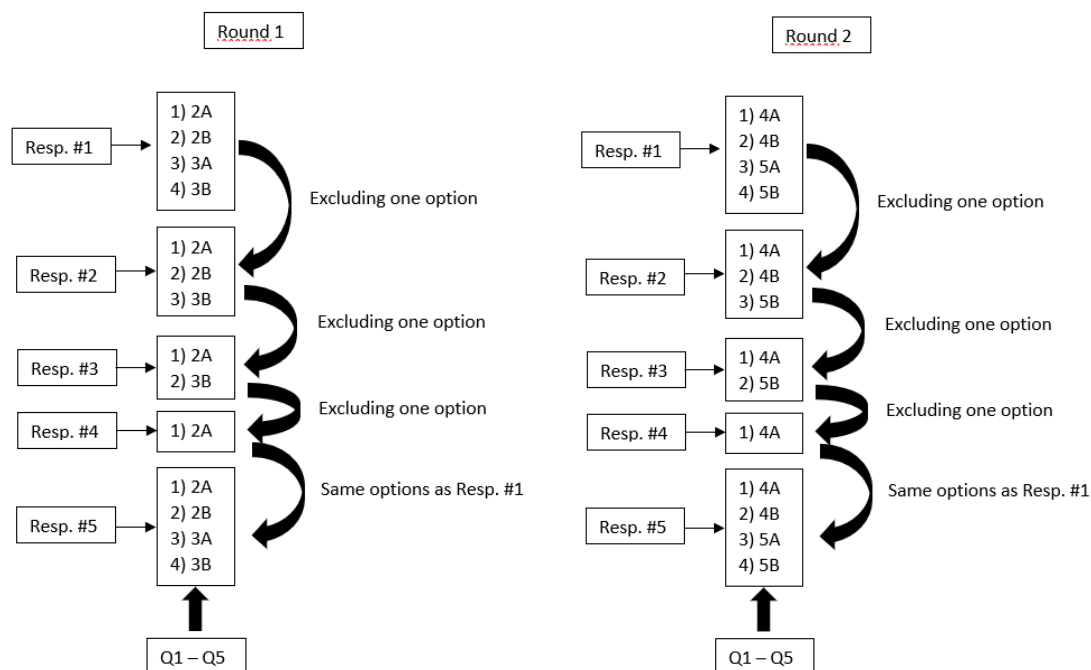
Schematic overview of the experimental design. The experimental procedure randomly confronts respondents consecutively with two endorsements, each followed by a five-question survey (denoted by Q1–Q5). For example, the first respondent is randomly assigned either Figure 2A, 2B, 3A, or 3B in round 1. The second respondent is also randomly assigned one of these figures, except for the one already shown to the first respondent and similar for the third respondent. Finally, the fourth respondent will see the endorsement that is not shown to the first, second, and third respondents. Round 2 follows the same approach. For example, the first respondent is randomly assigned either Figure 4A, 4B, 5A, or 5B. The second respondent is also randomly assigned one of these figures except for the one already shown to the first respondent and the same holds for the third respondent. Again, the fourth respondent will see the endorsement that is not shown to the first, second, or third respondents. The questionnaire is shown in the Appendix.

replicate the investment decision they would face in real life when encountering an online financial endorsement.

To mitigate response noise, the survey was designed such that only those respondents who express interest in the investment recommendation were asked to indicate their investment sum. We apply an incentive-compatible mechanism by requiring participants to make an investment decision with the €2.50 endowment they received for participating in the survey. Perceived riskiness, inclination to search for other information, and perceived reliability are measured on a 7-point scale. Answering these five questions finalizes round 1.

In the second round, the Ownership and Risky treatments are tested. Respondents view either the control or treatment version of one of the two endorsements. Again,

half of all respondents participate in the Ownership test and the others in the Risky test, to test hypothesis sets 3 and 4. After seeing the endorsement, respondents must answer the same five questions as in round 1, but the amount that they can invest differs. In round 2, respondents have the option to invest with a *hypothetical* €1,000 endowment. The reason why round 2 uses a hypothetical endowment is to prevent respondents from changing their initial investment decision in the first round. This approach prevents a scenario where a respondent initially planned to invest the full endowment amount but is unable to invest in round 2, since the initial endowment is already invested in the recommendation shown in round 1. After seeing the endorsement in round 2, respondents might regret their investment decision in round 1 and potentially change their amount invested in order to make an investment in round 2. Figure 1 depicts the experimental setup.

The survey concludes by respondents having to answer personal questions and questions about finfluencers, which are used as control variables in the regression model. After round 2 of the experiment, the survey continued to focus on controlling for differences among participants. We ask questions related to demographic characteristics of participants, their experience in investments, herding behavior, availability bias, loss aversion, financial literacy, and risk preference.

Finally, part 3 of the survey consists of exit questions about respondents' experiences with finfluencers (see the Appendix). All figures mentioned in the experimental setup are depicted in Section 3.2.

To test the hypotheses, we run the following general regression equation:

$$y_i = \beta_1 Treatment_i + \beta_2 Male_i + \beta_3 Crypto_i + \beta_4 Investments_i +$$

$$+\beta_5 Borrowed_i + \beta_6 FL_i + X_i'\beta + \varepsilon_i$$

The dependent variables (represented by y_i) are willingness-to-invest, amount invested, perceived riskiness, inclination to search other information sources, and perceived reliability. The independent variable *Treatment* is either the treatment variable Social Proof, Qualification, Ownership, or Risky treatments, which are the main coefficients of interest. *Male* is a gender dummy variable equal to 1 if the respondent is male and 0 otherwise. is a dummy variable equal to 1 if the respondent has ever bought any cryptocurrency and 0 otherwise. *Crypto* is a dummy variable equal to 1 if the respondent has made any investments and 0 otherwise. *Investments* is a dummy variable equal to 1 if the respondents has ever borrowed for investment purposes and 0 otherwise. *Borrowed* is a dummy variable equal to 1 if the respondent has answered every financial literacy question correctly and 0 otherwise. Finally,

X consists of dummy variables for age, education, and risk preferences. Education represents dummy variables for respondents who study Economics and Business Economics, Business Economics, Economics, International Business Administration, or Fiscal Economics, and Master's students. Risk preferences represent dummy variables for risk-averse, risk-neutral, and risk-seeking risk preferences. Amount invested, perceived riskiness, inclination to search other information sources, and perceived reliability are estimated by OLS, while willingness-to-invest is estimated by a probit model.

3.2 Design of the online financial endorsements

The online financial endorsements used in this thesis were designed in collaboration with the AFM, to assure their resemblance to actual online endorsements. Using hypothetical endorsements has several advantages. First, the endorsements are not traceable to actual endorsements on online platforms, thereby obviating privacy issues. The hypothetical endorsements are based on real financial endorsements. The original financial endorsements are left out since they are part of a confidential supervisory file of the AFM. Second, hypothetical endorsements reduce the risk of responses being contaminated by experience or familiarity with the endorsements by the respondents. Finally, using hypothetical endorsements prevents respondents from looking up extra information about the financial instruments being endorsed while participating in the survey experiment.

Online financial endorsements are based on a review of actual financial endorsements included in the AFM's first exploratory study on financial influencers, published in December 2021. These endorsements were published on popular social media platforms, such as Instagram, which is owned by Meta Platforms, Inc. Resnik and Stern (1977) introduced a framework to identify so-called "informational cues", which are pieces of information likely to affect investor behavior.

Cues may include (1) performance (e.g., expected returns, or historical performance), (2) quality (e.g., qualities of the underlying asset), and (3) price (e.g., price of a stock). Financial endorsements only consist of very limited informational cues; this is reflected in the hypothetical online financial endorsements in this study. In addition, favorable attributes, such as financial return, are presented in attention-grabbing formats and icons, increasing their relative visual prominence. We developed four financial endorsement templates, each representing a different treatment group. These mimic actual online endorsements.

Financial endorsement to test Hypothesis 1

To test the first set of hypotheses, we designed two alternatives (Figure 2) of a financial endorsement, varying in the number of followers. We refer to this treatment as *Social Proof*. Based on the AFM publication on financial influencers (AFM, 2021), the number of followers ranges between a dozen to a tens of thousands, while the average finfluencer has 11,000 followers. The number of followers for the control group is generated by a random number generator ranging between 1 to 50 followers, which is 7, while the number of followers for the treatment group was between 10,000 and 20,000, which is 11,132.

Figure 2 – Social Proof control and treatment group images
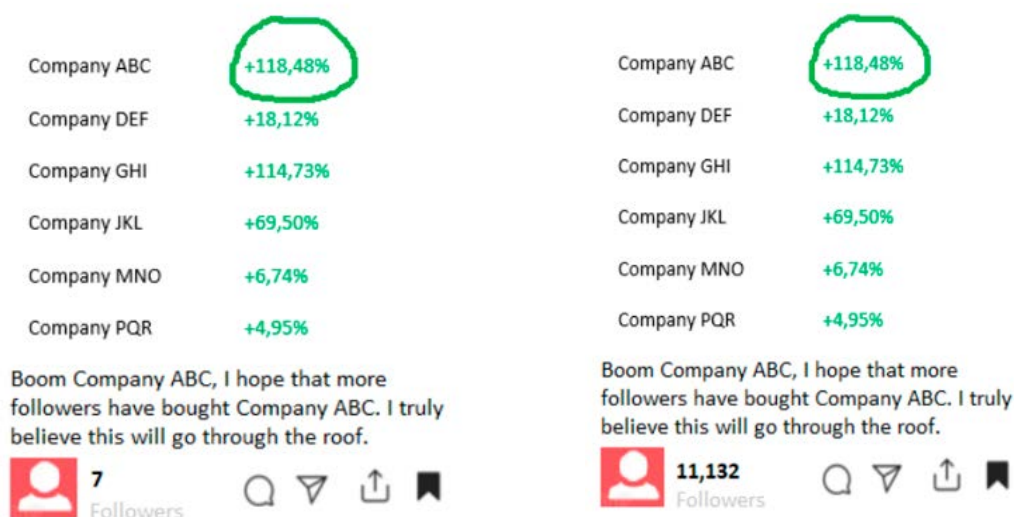
Panel A – Control group for Social Proof
[7 followers]

Panel B – Treatment group for Social Proof
[11,132 followers]

Financial endorsement to test Hypothesis 2

The panels for the second set of hypotheses to be tested, depicted below as Figure 3, represent the control group and treatment group, respectively. These endorsements vary in terms of additional information about the endorser. To provide financial advice, one needs to have both relevant education and work experience. Hence, the treatment group will see an endorsement in which the endorser is a person who is "Certified to give financial advice" and "Gained work experience at a renowned company making investment decisions for individuals", referred to as *Qualification*. This information is omitted for the control group. Based on the 2021 AFM study, none of the finfluencers in the study are licensed by the AFM, and many of them do not have a relevant degree in the field of finance. As such, it is unclear how finfluencers

would articulate their relevant financial education and work experience in an online endorsement, thus impeding the resemblance of the hypothetical endorsements in this thesis to financial endorsements seen in practice.

Figure 3 – Qualification control and treatment group images
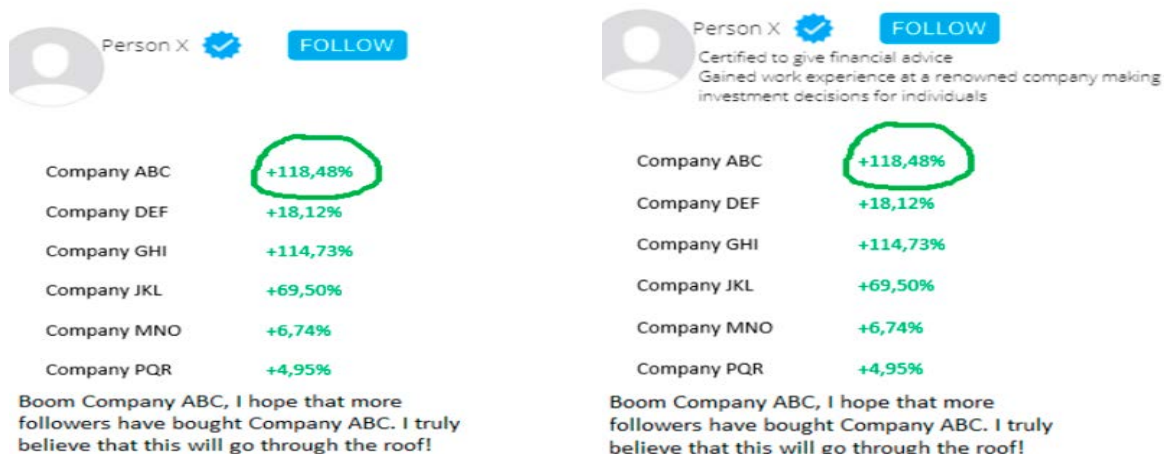
Panel A – Control group for Qualification   Panel B – Treatment group for Qualification

Financial endorsement to test Hypothesis 3

To test the third set of hypotheses, we again designed two alternatives: a control group (no disclosure about stock ownership) and a treatment group (with disclosure about stock ownership), depicted below. These alternatives vary, by explicitly includ-ing the words "I have bought this stock myself" in the endorsement shown to the treatment group, while excluding this for the control group. We refer to this treatment as *Ownership*. AFM's (2021) study observed that very few finfluencers explicitly men-tion their personal stock holdings, even though this is a requirement of the MAR.

Figure 4 – Ownership control and treatment group images

Panel A – Control group for Ownership   Panel B – Treatment group for Ownership

It is unclear how finfluencers would articulate their stock ownership in endorsements. As such, the words "I have bought this stock myself" might not match real online financial endorsements and could be considered a shortcoming in the design of the survey experiment.

Financial endorsement to test Hypothesis 4
To test the fourth set of hypotheses we vary the treatment and control groups by including the word "risky" and "safe", respectively. We refer to this treatment as *Risky*. Figure 5 depicts the control group and the treatment group, respectively. One of the risks identified by the AFM (2021) about finfluencers is that some of them recommend risky products. Risky products include cryptocurrencies, forex, Contracts for Differences, and turbos. The AFM has issued several warnings on the risks of these products. In general, these risky products are not suitable for beginning retail investors, while cryptocurrencies are largely not subject to supervision as of 2022.

Figure 5 – Risky control and treatment group images

Hi All!
I've come across this company named Lactalis Group
Perhaps a nice investment for a safe portfolio!

Hi All!
I've come across this company named Lactalis Group, trading as a turbo stock using leverage. Perhaps a nice investment for a risky portfolio!

Panel A – Control group Risky   Panel B – Treatment group Risky

4. Empirical results

In this section we discuss the descriptive statistics of the data, the multivariate regression analysis, additional analyses, and the qualitative responses to the survey.

4.1 Descriptive statistics

Of the 277 recorded participants, 216 completed the experiment and survey in its entirety. The demographic and investor characteristics are presented in Table 2. Prior literature using survey methodology controlled for socioeconomic characteristics (e.g. income levels, marital status, and occupation) (Cox & de Goeij, 2020a). Because the target group of most finfluencers consists of young, inexperienced retail investors, we expect little variation in socioeconomic characteristics. In addition, asking for these variables might involve sensitive information, thus dissuading participants from completing the experimental survey. Table 2 shows the descriptive statistics for gender, age, educational background, experience in cryptocurrencies and investments, financial literacy, and risk preference. Table 2 shows that the majority of respondents are men (67.1%), young (not reported, but 80.55% of the respondents are 18–20 years old). The largest proportion study International Business Administration (IBA) (35.2%), followed by Business Economics (21.3%) and Economics and Business Economics (20.7%). A substantial number of respondents have bought cryptocurrencies (32.4%) and currently have some sort of investment (43.1%).

Of the 133 respondents who have either bought cryptocurrencies or have other investments, 12.8% use borrowed funds for investment purposes. Those who borrow do this for an average amount of almost €6,000. This average drops to €4,236.36 when excluding the maximum of €25,000 borrowed. A majority of respondents answered all financial literacy questions correctly (54.0%). Finally, respondents mostly show risk-averse behavior (65.3%), followed by risk- seeking (20.7%), and risk-neutral behavior (14.1%).

The descriptive statistics regarding the exit questions related to prior experience with finfluencers are presented in Table 3. A majority of respondents are familiar with the phenomenon of finfluencers (78.4%). Using the AFM definition, this is a person who speaks about investing on social media. Most respondents (86.4%) never acted upon a finfluencer's advice.

Respondents who followed advice either once or multiple times (6.8% + 6.8% = 13.6%) scored a mean value of 4.34 on a 7-point scale to the question how satisfied they were with the investment endorsed by a finfluencer. Furthermore, it seems that respondents do not often discuss the advice with others (mean value 2.17 out of 7).

Table 2 – Demographic and investment experience descriptive statistics

Variables	Mean	Std. Dev.
Male	67.1%	47.1%
Age (in years)	19.852	2.013
Education variables		
BSc Economics and Business Economics	20.8%	40.7%
BSc Business Economics	21.3%	41.0%
BSc Economics	6.5%	24.7%
BSc International Business Administration	35.2%	47.9%
BSc Fiscal Economics	4.6%	21.1%
BSc Master degree	10.2%	30.3%
Experience in cryptocurrencies and regular investments		
Has bought and still owns cryptocurrencies	32.4%	46.9%
Has bought cryptocurrencies but does not own any right now	8.3%	27.7%
Has never bought any cryptocurrencies	59.3%	49.2%
Has invested and still owns financial asset(s)	43.1%	49.6%
Has invested in financial asset(s) but does not own any now	8.8%	28.4%
Has never invested	48.1%	50.1%
Borrowed to invest (N=133)	12.8%	33.5%
Amount borrowed for investment purposes (in euros) (N=12)	5,966.67	6,701.74
Financial literacy (N=213)		
First financial literacy question correctly answered	68.5%	46.5%
Second financial literacy question correctly answered	75.1%	43.3%
Third financial literacy question correctly answered	56.9%	33.9%
All financial literacy questions correctly answered	54.0%	50.0%
Risk preference (N=213)		
Risk-averse	65.3%	47.7%
Risk-seeking	20.7%	40.6%
Risk-neutral	14.1%	34.9%
Number of observations	216	

This table contains the mean and standard deviation on demographic and investment experience characteristics of the complete data set. All variables are measured as dummies, except for the amount borrowed for investment purposes, which is measured in euros.

Nor do they read or watch the posts of finfluencers frequently (mean value 2.90 out of 7).

The descriptive statistics on behavioral biases that respondents show are presented in Table 4. Based on Table 4, we observe that, for most behavioral bias-related questions, respondents had a mean value below 4, which represents the response of "neither agree nor disagree". The only exception is the question where respondents were asked to indicate to what extent they agreed with the statement "While considering whether to invest in a financial asset, I put more weight on its recent performance" (4.67). About half of the respondents seem to exhibit biases for availability (50.0%) and loss aversion (54.5%), which is more than for herding bias (35.0%) and regret aversion bias (28.2%).

Table 3 – Descriptive statistics on finfluencers

	Mean	Std. Dev.
Familiar with the term finfluencer (N=213)	78.4%	41.2%
Followed finfluencer's advice in the past multiple times (N =167)	6.8%	25.3%
Followed finfluencer's advice in the past just once (N = 167)	6.8%	25.3%
Never followed finfluencer's advice (N = 167)	86.4%	34.7%
Satisfaction with finfluencer's advice (1–7) (N = 29)[1]	4.34	1.36
Discussing finfluencer's advice with others (1–7) (N = 165)[2]	2.17	1.11
Frequency of reading or watching posts (1–7) (N = 201)[3]	2.90	1.90

This table presents the mean and standard deviation on the exit questions related to financial influencers. All variables are measured as dummies, except for satisfaction on finfluencer's advice, discussing finfluencer's advice with others, and the frequency of reading or watching finfluencer's posts, which is measured on a 7–point scale.

1 The answer options range between (1) very dissatisfied to (7) very satisfied

2 The answer options are (1) never, (2) rarely, (3) sometimes, (4) often, and (5) very often

3 The answer options are (1) never, (2) once every 6 months, (3) once every 3 months, (4) once a month, (5) once a week, (6) daily, and (7) several times a day

Table 4 – Descriptive statistics on behavioral biases

	Mean	Std. Dev.
Selling all or part of investments	3.67	1.65
Feeling less disappointed if others experienced similar loss	3.96	1.74
Herding bias (N = 208)[1]	51.9%	50.1%
Close friends/relatives are reliable reference for investments	3.65	1.57
Putting more weight on asset's recent performance	4.67	1.31
Availability bias (N = 211)[2]	65.9%	47.5%
Avoid investing in assets that led to losses in the past	3.64	1.46
Regret aversion bias (N = 201)[3]	557%	49.8%
A1: 50% chance of gaining € 1,000 and 50% chance of gaining €0	17.4%	38.0%
B1: 100% chance of gaining €500	82.6%	38.0%
A2: 50% chance of losing € 1,000 and 50% chance of losing €0	67.1%	47.1%
B2: 100% chance of losing €500	32.9%	47.1%
Loss aversion bias (N = 213)[4]	56.3%	49.7%

This table presents the mean and standard deviation on the behavioral bias questions, adopted from Ritika and Kishor (2020) and Tversky and Kahneman (1979). All variables are measured on a 7–point scale ranging between (1) strongly disagree and (7) strongly agree, except for herding bias, availability bias, regret aversion bias, and loss aversion bias, which are dummies. The questionnaire can be found in the Appendix.

1 Dummy variable, which takes the value 1 when the average score on questions "Selling all or part of investments" and "Feeling less disappointed if other investors experienced similar loss" is greater than 4, and 0 otherwise.

2 Dummy variable, which take the value 1 when the average score on questions "Information from close friends and relatives is a reliable reference for investment decisions" and "Putting more weight on a financial asset's recent performance" is greater than 4, and 0 otherwise.

3 Dummy variable, which takes the value 1 when the score on question "Avoid investing in assets which led to losses in the past" is strictly greater than 4, and 0 otherwise.

4 Dummy variable, which takes the value 1 when respondents choose "B1: 100% chance of gaining €500" and "A2: 50% chance of losing €1,000 and 50% chance of losing €0" consecutively, and 0 otherwise.

Table 5 – Descriptive statistics by treatment conditions

Treatment condition:	Social proof		Qualification		Ownership		Risky	
	Yes	No	Yes	No	Yes	No	Yes	No
Willingness-to-invest	0.298	0.316	0.362	0.250	0.088	0.140	0.154	0.189
Amount invested in euros (Round 1)	1652.38 (N=16)	1247.18 (N=17)	1463.00 (N=21)	1282.67 (N=12)	.	.	.	.
Amount invested in euros (Round 2)	.	.	.	.	293.20 (N=5)	557.63 (N=8)	494.50 (N=8)	249.10 (N=10)
Risk perception	5.538	5.353	5.071	5.458	5.942	5.922	5.680	5.500
Consult other information	6.679	6.455	6.397	6.627	6.345	6.140	6.184	6.412
Reliability	**3.396**	**2.600**	3.103	3.000	2.600	2.291	3.060	3.163
Number of observations	52-57	51-57	56-58	48-56	52-57	51-57	49-52	49-53

This table presents the means across the treatment conditions Social proof, Ownership, Qualification, and Risky. *Willingness- to-invest* is measured as a binary variable equal to 1 when respondents are willing to invest in the endorsement (answer "Yes"), and 0 otherwise (answer "No"). *Amount Invested (Round 1)* and *Amount Invested (Round 2)* are measured on a continuous scale ranging between €0 and €2,500, and €0 and €1,000, respectively. *Risk Perception* is measured on a seven-point scale ranging from 1 "not risky at all" to 7 "very risky". *Consult Other Information* is measured on a seven-point scale ranging from 1 "certainly not consulting other information" to 7 "certainly consulting other information". *Reliability* is measured on a seven-point scale ranging from 1 "not reliable at all" to 7 "very reliable". p-values ≤ 0.05 for the two-sided difference-in-means tests are indicated in bold. The questionnaire can be found in the Appendix. By construction, Social proof and Qualification are tested in round 1, while Ownership and Risky treatments are tested in round 2. This explains why there is no observation for Amount Invested in euros (Round 1) for Ownership and Risky and no observations for Amount invested in euros (Round 2) for Social proof and Qualification.

The descriptive statistics on the explanatory variables are provided in Table 5. There is no significant difference in perceived riskiness, willingness-to-invest, and average amount invested when an endorser has relatively more followers. In addition, there is no significant difference in the intention to search for additional information, consistent with the hypothesis.

All respondents who answered question 4a ("Would you consider other sources of information before considering investing in this recommendation?", found in the Appendix) with a value strictly greater than 2 were asked to indicate which sources of information they would consult before making an investment decision. Descriptive statistics in Figure 6 reveal that most respondents (86.5% in round 1e and 88.1% in round 2) rely on stock price data, followed by websites for investors (67.91% and 73.8%), annual reports (65.12% and 66.8%), and a company's website (61.4% and

Figure 6 – Descriptive statistics on the sources of information to consult
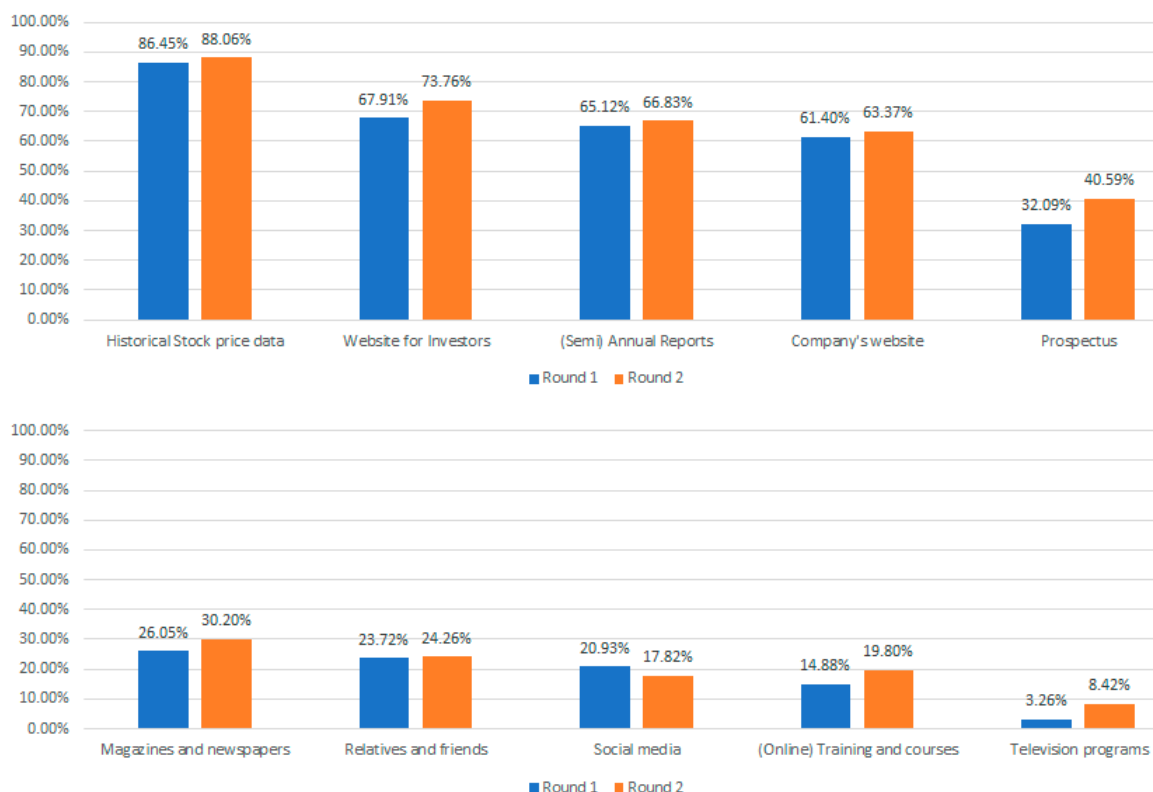
This figure contains the sources that respondents would consult in addition to the endorsement of round 1 (N=214 for Historical Stock Price Data and N=215 for all others) and round 2 (N=201 for Historical Stock Price Data and N=202 for all others) in descending order. All variables are measured as dummies.

63.4%). None of the mean values for the usage of additional information sources significantly differ between the first and second rounds.

4.2 Multivariate regression analysis

In this section we present the findings from OLS regressions that include control variables, inspired by Van Rooij et al. (2011) due to similarity in research questions and data. However, the model excludes controls for some demographics (family situation, labor market position, and marital status) and financial characteristics (wealth and income) since we do not expect much variation for these characteristics in our sample. We do, however, control for other demographics (gender, age, education), financial literacy, and risk preference since we expect these control variables to influence the effects of the experiment. For the willingness-to-invest outcome variable, we use a probit model rather than a linear probability model (LPM). The two main disadvantages of LPM are that the model can predict probabilities below 0 or above 1, and that it violates the assumption of homoscedasticity. The probit model overcomes the

disadvantages of LPM. A probit model is non-linear in parameters, restricting proba-bilities to between 0 and 1. By conducting the survey in a randomized controlled trial, where respondents are randomly assigned in treatment and control groups, we have tried to overcome the problem of endogeneity. The three sources of endogeneity are omission of relevant variables, reverse causality, and measurement error. With regards to omitting relevant variables, this problem is reduced by including control variables in the regression models.

The problem of reverse causality is irrelevant in this study since respondents first see the online financial endorsement before answering the survey questions. The treatments have a causal relation on the dependent variables, and not the other way around. Finally, since respondents inherently self-report their answers during a survey, there may be some error in responses. It is possible that respondents misin-terpreted the questions, or that they unintentionally clicked an answer option during the questionnaire that did not represent their true answer option. Table 6 shows the condensed regression results.

The average predicted probability of the willingness-to-invest for respondents who see an endorsement by a finfluencer with many followers is 8.3 percentage points lower compared to those who see a finfluencer's endorsement with fewer followers, holding other factors fixed. The average amount invested increases by €480.75, or 38.5% (€480.75 / €1,247.18), for the treatment group compared to the control group, ceteris paribus.

Furthermore, there is a positive effect on perceived riskiness, and respondents are more willing to consult additional information sources before making an investment decision when faced with an endorsement with many followers compared to few followers, ceteris paribus. However, the above observations are statistically insignifi-cant. Panel A also indicates that social proof increases perceived reliability by 28.7%, consistent with the hypothesis. This result is significant at the 5% significance level. We obtain marginal effect size by dividing the regression coefficient by the average response for the nontreated control group found in Table 5. For example, the coeffi-cient found in Panel A of 0.746 is scaled to the average reliability for the nontreated control group of 2.6, which is 28.7%.

As shown in Panel A, we find no evidence to support hypotheses 1a – 1d, but we do find evidence that *Social Proof* is positively associated with perceived reliability, consistent with hypothesis 1e. Panel B shows no statistically significant effects of the qualification variable on perceived riskiness at the 5% significance level. Therefore, we find no evidence to support hypotheses 2a – 2e. Panels C and D include an interaction term between the treatments and a dummy variable indicating any prior

Table 6 – Multivariate regression analysis of first round responses

	Willingness-to-invest	Amount Invested	Risk Perception	Consult Other Information	Reliability
Panel A: Social Proof treatment					
Social Proof	−0.083 [−0.91]	480.75 [1.54]	0.220 [0.86]	0.260 [1.24]	0.746** [2.24]
Control variables	Yes	Yes	Yes	Yes	Yes
N	95	31	98	104	102
R²	.	0.086	0.263	0.295	0.199
Pseudo R²	0.150	.	.	.	.
Panel B: Qualification treatment					
Qualification	0.123 [1.48]	132.93 [0.43]	−0.380 [−1.63]	−0.216 [−1.24]	0.061 [0.19]
Control variables	Yes	Yes	Yes	Yes	Yes
N	104	32	103	107	109
R²	.	0.028	0.217	0.352	0.135
Pseudo R²	0.158	.	.	.	.
Panel C: Interaction analysis Social Proof x Finfluencer					
Social Proof x Finfluencer	0.262 [0.94]	−550.13 [−1.16]	1.018 [1.09]	−0.160 [−0.30]	−0.900 [0.78]
Social Proof	−0.091 [−0.76]	300.13 [0.70]	−0.061 [−0.15]	0.306 [0.89]	1.415** [2.66]
Finfluencer	−0.122 [−1.50]	1385.21** [3.84]	−0.810 [−1.31]	0.350 [0.78]	0.732 [1.02]
Control variables	Yes	Yes	Yes	Yes	Yes
N	74	24	77	82	81
R²	.	0.237	0.283	0.353	0.221
Pseudo R²	0.158	.	.	.	.
Panel D: Interaction analysis Qualification x Finfluencer					
Qualification x Finfluencer	0.152 [0.61]	656.58 [0.74]	−0.243 [−0.32]	−0.352 [−0.59]	−0.302 [−0.30]
Qualification	0.107 [1.18]	110.09 [0.24]	−0.146 [−0.48]	0.045 [0.23]	0.163 [0.38]
Finfluencer	0.365** [2.87]	−33.25 [−0.05]	−0.764 [−1.27]	−0.245 [−0.66]	0.861 [1.10]
Control variables	Yes	Yes	Yes	Yes	Yes
N	82	22	82	84	86
R²	.	0.10	0.259	0.346	0.118
Pseudo R²	0.210	.	.	.	.

This table contains the results for the OLS and probit model regressions. The dependent variables are *Willingness-to-invest*, measured as a binary variable equal to 1 when respondents are willing to invest in the endorsement (answer "Yes"), and 0 otherwise (answer "No"). *Amount Invested* is measured on a continuous scale ranging between €0 and €2,500. *Risk Perception* is measured on a seven-point scale ranging from 1 "not risky at all" to 7 "very risky". *Consult Other Information* is measured on a seven-point scale ranging from 1 "certainly not consulting other information" to 7 "certainly consulting other information". *Reliability* is measured on a seven-point scale ranging from 1 "not reliable at all" to 7 "very reliable". Panel A includes a dummy variable, *Social Proof*, that is equal to 1 if many (11,132) followers are included in the endorsement and 0 otherwise. Panel B includes a dummy variable, *Qualification*, that is equal to 1 if the endorsement includes a description of the endorser being qualified to give financial advice and 0 otherwise. Panel C includes the interaction term between *Social Proof* and *Finfluencer*, where *Finfluencer* is a dummy

variable equal to 1 if the respondent has ever acted upon prior finfluencer's advice and 0 other-wise, while panel D includes the interaction between *Qualification* and *Finfluencer*. First round responses are used to control for gender, education, experience in investing, financial literacy, and risk preference. Due to the low sample size for Amount Invested (N = 22–32), we only control for risk preference. Robust t-statistics and z-statistics are reported in brackets. The estimates on Will-ingness-to-invest are the average marginal effects. Pseudo R2 and Likelihood Ratio are reported for the probit model. Significance is indicated by ***, **, and * at the 1%, 5%, and 10% levels, respectively.

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investments made by respondents based on finfluencer's endorsements. None of these interaction terms are statistically significant. The effects of social proof and qualification of giving financial advice on perceived riskiness, willingness-to-invest, average amount invested, inclination to consult other information, and perceived reliability do not vary with respondents' prior experience with finfluencers. This result suggests that the impact of familiarity with online financial endorsement is limited. Note that, especially in case of the Amount Invested regressions, the number of observations is quite small.

Panel A of Table 7 indicates that the average predicted probability of the willing-ness-to-invest, for respondents who see an endorsement by a finfluencer disclosing stock ownership, is 11 percentage points lower compared to those who see a finflu-encer's endorsement with no disclosure, ceteris paribus. This effect is significant at the 10% level.

Moreover, disclosing stock ownership decreases the average amount invested by €201.77, increases risk perception by 2.75% (=0.163/5.922), increases the inclination to consult other information by 3.45% (-0.212/6.140), and increases the perceived reliability by 13.14% (0.301/3.060) compared to the control group, ceteris paribus. However, none of the these findings are statistically significant, even at the 10% significance level. Based on Panel A, we find no evidence to support any hypothesis listed in the third set of hypotheses.

Panel B shows that including the word "risky" in an online endorsement decreases the probability of the willingness-to-invest by 2.4 percentage points on average, ceteris paribus. Moreover, Panel B suggests a positive relationship between the Risky treatment and the average amount invested. On average, respondents are inclined to invest €182.71 more in an endorsement including the word "risky" compared to an endorsement including the word "safe", holding other factors fixed. Consistent with hypothesis 4a, we find a positive relationship between perceived riskiness and including the word "risky" in an online endorsement. Furthermore, there is a negative relationship between the treatment variable and the inclination to consult

Table 7 – Multivariate regression analysis of second round responses

	Willingness-to-invest	Amount Invested	Risk Perception	Consult Other Information	Reliability
Panel A: Ownership treatment					
Ownership	-0.110* [-1.67]	-201.77 [-1.46]	0.163 [0.37]	0.212 [0.71]	0.301 [0.85]
Control variables	Yes	Yes	Yes	Yes	Yes
N	100	13	100	109	108
R²	.	0.429	0.128	0.281	0.11
Pseudo R²	0.289	.	.	.	.
Panel B: Risky treatment					
Risky	-0.024 [-0.30]	182.71 [1.84]	0.095 [0.25]	-0.298 [-0.81]	0.009 [0.03]
Control variables	Yes	Yes	Yes	Yes	Yes
N	92	18	97	99	99
R²	.	0.343	0.105	0.085	0.21
Pseudo R²	0.222	.	.	.	.
Panel C: Interaction analysis Ownership x Finfluencer					
Ownership x Finfluencer	0.236 [1.25]	-143 [-0.18]	1.198 [1.17]	1.819* [1.81]	-0.208 [-0.15]
Ownership	-1.24 [-0.98]	-231 [-1.05]	-0.043 [-0.14]	-0.072 [-0.21]	0.427 [1.05]
Finfluencer	-0.689 [1.865]	-85 [-0.13]	-1.368** [-2.22]	-0.636 [-0.87]	0.541 [0.93]
Control variables	Yes	Yes	Yes	Yes	Yes
N	72	8	78	84	84
R²	.	0.495	0.302	0.308	0.111
Pseudo R²	0.503	.	.	.	.
Panel D: Interaction analysis Risky x Finfluencer					
Risky x Finfluencer	0.212 [0.92]	-96.410 [-0.42]	-0.550 [-0.58]	1.978** [2.58]	0.854 [0.89]
Risky	-0.019 [-0.19]	47.41 [0.25]	0.401 [0.88]	-0.849* [-1.73]	-0.235 [-0.57]
Finfluencer	0.100 [0.78]	122.28* [1.99]	0.451 [0.62]	-0.746 [-1.36]	-0.057 [-0.00]
Control variables	Yes	Yes	Yes	Yes	Yes
N	73	14	77	79	79
R²	.	0.244	0.138	0.186	0.194
Pseudo R²	0.308	.	.	.	.

This table contains the results for the OLS and probit regressions. The dependent variables are *Willingness-to-invest*, measured as a binary variable equal to 1 when respondents are willing to invest in the endorsement (answer "Yes"), and 0 otherwise (answer "No"). *Amount Invested* is measured on a continuous scale ranging between €0 and €1,000. *Risk Perception* is measured on a seven-point scale ranging from 1 "not risky at all" to 7 "very risky". *Consult Other Information* is measured on a seven-point scale ranging from 1 "certainly not consulting other information" to 7 "certainly consulting other information". *Reliability* is measured on a seven-point scale ranging from 1 "not reliable at all" to 7 "very reliable". Panel A includes a dummy variable, *Ownership*, that is equal to 1 if the endorsement discloses stock ownership of the endorser and 0 otherwise. Panel B includes a dummy variable, *Risky*, that is equal to 1 if the endorsement contains the word "risky" and 0 otherwise. Panel C includes the interaction term between *Ownership* and *Finfluencer*, where *Finfluencer* is a dummy variable equal to 1 if the respondent has ever acted

upon prior finfluencer's advice and 0 otherwise, while panel D includes the interaction between *Risky* and *Finfluencer*. The estimate of the finfluencer dummy is presented as x 1,000. Second round responses are used to control for gender, education, experience in investing, financial literacy, and risk preference. Due to the low sample size for Amount Invested (N = 13), we only control for risk preference. Robust t-statistics and z-statistics are reported in brackets. The results on Willingness-to-invest are the average marginal effects. Pseudo R2 and Likelihood Ratio are reported for the probit model. Significance is indicated by ***, **, and * at the 1%, 5%, and 10% levels, respectively.

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other information and a positive relationship between the perceived reliability and the Risky treatment. However, none of these results are statistically significant, even at the 10% significance level.

Based on Panel B, we find no evidence to support any hypothesis listed in the fourth set of hypotheses.

Panels C and D include an interaction term between the treatments and a dummy variable that indicates any prior investments made by respondents based on finfluencer's endorsements. Only in case of the 'Consult other information' regression is there a significant interaction effect between the ownership and finfluencer dummy and between the risky and finfluencer dummy. The effects of the treatments in Table 7 do not vary with prior experience with respondents' experience with finfluencers, suggesting that the impact of familiarity with online financial endorsements is limited.

4.3 Qualitative response analysis

The survey contained a question about the reason why respondents would be unwilling to invest in the stock being endorsed. To analyse the qualitative responses, we used the Text Mining package tm in R software. The purpose of this analysis is twofold. First, we seek to know the main reason why respondents are unwilling to invest in an online financial endorsement across all treatments. Second, by analyzing the qualitative responses for each treatment, we seek to know whether respondents mention anything about the treatment or control group conditions.

The cleaning of text was done in the following steps. First, all responses were converted to lower case text. Next, all numbers, common English stop words, punctuations, and extra white space were removed. The wordcloud depicted in Figure 7 reveals that most respondents mention the lack of information in endorsements.

The reason "lack of information" seems plausible, as most online financial endorsements are characterized by their limited amount of information disclosed. In general, it seems that respondents noticed the treatment conditions. Table 8 depicts the most important reasons for not investing, for each treatment condition.

Figure 7 – Wordcloud on the reason for not investing across all treatment conditions
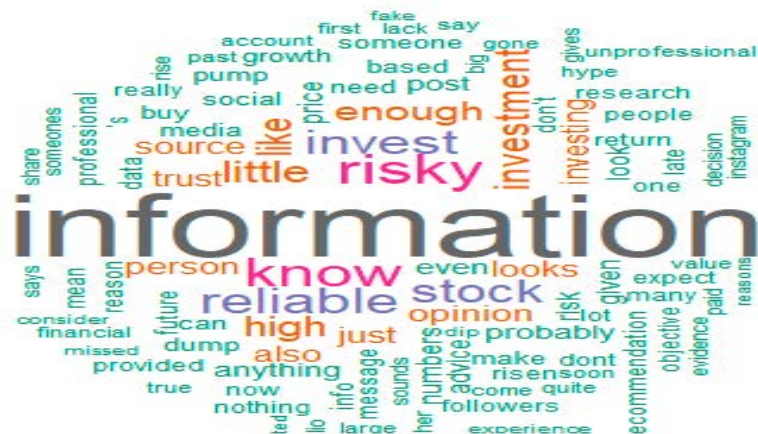
Table 8 – Most important reasons for not investing for each treatment condition

Treatment conditions	Respondents' quotes
Social Proof	"Only 7 followers, not enough to be trustworthy"
	"I don't trust 7 follower accounts"
	"The page has just 7 followers."
Qualification	"I don't trust X"
Ownership	"Probably a paid partnership"
	"Pump and dump"
Risky	"I do not like turbos"
	"Way too risky"

5. Discussion

In this section we discuss the external validity, the limitations of this study, and the policy implications.

The survey-experiment approach and simplified decision environment that we use to collect data may lead to an under- or overestimation of the effects and the precision and validity of the results. All data points are self-reported by respondents, which might lead to measurement errors. The validity of survey experiments is partly driven by the use of a representative sample and the random assignment to treatment groups.

Both conditions are fulfilled in our research design as the majority of the sample falls in the 18- 20-years age bracket. Beshears et al. (2017) show that minor variations in experimental context can lead to markedly different decision outcomes. This finding emphasizes the importance of closely mimicking the actual decision environment. We therefore developed treatments that closely align with actual online financial endorsements by Dutch finfluencers.

As for the limitations of this study, one that has been briefly mentioned pertains to measurement errors. Respondents may interpret questions in different ways, which can lead to distortions in the data. Furthermore, we have sampled primarily from first-year university students. Sampling from other educational backgrounds might lead to different findings. In addition, the design of the experiment is based on publicly available written online endorsements. This study does not provide insight on how respondents would react to videotaped online endorsements or endorsements posted in closed environments, such as private Telegram groups or platforms accessible by invitation from other platform users.

As to policy implications, the definition of an online financial influencer by the AFM is currently broadly formulated in that every person who speaks about investing on a social media platform is considered a finfluencer. Based on the findings of this thesis, we recommend that the AFM focuses on finfluencers who claim to have some sort of qualification for rendering advice on investment decisions. In addition, it is best to focus on finfluencers with a relatively large number of followers. These policy implications are based on the two main findings of this study. That is, social proof increases the perceived reliability, and qualification decreases the perceived riskiness of an online endorsement. In addition, we find no effect of the treatments on willingness to invest. It appears, based on this study, that few young university students are interested in making investments based on online financial endorsements.

6. Conclusion

Online financial endorsements by influencers can assist investors in assessing the quality of investments. While financial market supervision is in place, the effects of endorsements on investor behavior are insufficiently understood.

Using an incentive-compatible survey experiment for a sample consisting of Tilburg University first-year students, we find that online financial influencers with a relatively high number of followers increase the perceived reliability of the endorsement by 28.7%. In addition, finfluencers claiming to be qualified to give financial advice decrease the perceived riskiness of the endorsement by 13.1%. Sensitivity to the number of followers and claiming qualification are affected by financial literacy, but not for risk-seeking behavior and behavioral biases. Financially literate investors tend to invest less in financial assets endorsed compared to less literate investors.

As to the Qualification treatment, financial literacy increases the inclination to consult additional information sources before making an investment decision. Respondents who exhibit risk-seeking behavior, who are confronted with an endorsement that explicitly states that the endorsement is risky, are inclined to invest more. Furthermore, we find no effect of any treatments on the willingness to invest. These findings contribute to the literature on investment endorsements and deepen our understanding of online financial influencers. If a decrease in perceived riskiness and an increase in perceived reliability of endorsements due to qualification and the number of followers, respectively, leads to sub-optimal investment decisions, then that pleads for supervision of finfluencers. No treatment was able to predict the willingness to invest in financial products endorsed online. Overall, respondents are skeptical to invest strictly on the basis of online financial endorsements, as inferred from the low sample size on the average amount invested in the endorsement and from our qualitative analysis of the reasons for not investing.

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Appendix

Questionnaire part one
After each endorsement in the experiment:

Question 1 (Willingness-to-invest):
Would you invest in Company ABC?
Answer: Yes or No

Question 2a (Amount invested) (if response to question 1 is "Yes") (Round 1)
Now suppose that the €2.50 you earn with this survey is equal to 2,500 points. You can now choose to invest part or all of these 2,500 points in company ABC. How many of these 2,500 would you invest in ABC?
Answer: amount ranging from €0 to €2.50.

Question 2a (Amount invested) (if response to question 1 is "Yes") (Round 2)
Suppose you have €1,000 available for investment purposes. How much would you be willing to invest? (Note: this investment decision will not affect your actual financial compensation from participating in this survey)
Answer: amount ranging from €0 to €1,000.

Question 2b (Reason for not investing) (if response to question 1 is "No")
What is the reason for not investing?
Answer: open.

Question 3 (Risk perception):
How risky do you consider this investment recommendation?
Answer: 7-point scale: 1 not risky at all, to 7 very risky.

Question 4a (Consult other information)
Would you consider other sources of information before considering investing in this recommendation?
Answer: 7-point scale: 1 would certainly not consult other information – 7 would certainly consult other information.

Question 4b (Sources of information) (if response to question 4a > 2)
What sources would you consult? (Multiple answers possible)
Answer: (Historical) stock price data, Website for investors, Magazines and news-papers, (Semi-)annual reports, Relatives and friends, Prospectus/information from provider of the investment, Television programs, Social media/famous people that provide information about investing, (Online) training and courses, Company website

Question 5 (Reliability)
How reliable did you find the recommendation?
Answer: 7-point scale: 1 not reliable at all, to 7 very reliable

Questionnaire part two
Control variables

Question 1: What do you study?
Answer: Economics and Business Economics (EBE), Business Economics, Fiscal Economics, International Business Administration (IBA), Master Finance, Other.

Question 2: What is your gender?
Answer: Male, Female, Non-binary (X), Prefer not to say.

Question 3: What is your age?
Answer: 17 or younger, 18, 19, 20, 21, 22, 23, 24, 25, 26 or older.

Question 4: Have you ever bought any cryptocurrencies (e.g. Bitcoin, Ethereum, Litecoin, Cardano)?
Answer: Yes, and I still have cryptocurrencies; Yes, but I no longer own cryptocurrencies; No.

Question 5: Have you ever invested in a financial asset (e.g. stocks and bonds)? Note: cryptocurrencies are not included.
Answer: Yes, I still have some sort of investment(s); Yes, but I no longer own investment(s); No

Question 6a: Did you ever borrow to invest (e.g. by using a student loan)? (if response to question 4 or question 5 is "Yes,...")
Answer: Yes, No

Question 6b: How much in total did you borrow for investing? (Leave open if you prefer not to say) (if response to question 6a is "Yes")
Answer: open.

Question 7: Suppose there are concerns about the overall condition of the economy in the coming months and most investors sell their stocks. Considering this, I would also sell all or part of my stock investments in this situation.
Answer: (1) Strongly disagree, (2) disagree, (3) somewhat disagree, (4) neither agree nor disagree, (5) somewhat agree, (6) agree, (7) strongly agree, I do not know.

Question 8: When I lose money on an investment, I feel less disappointed if other investors also experience the same loss.
Answer: (1) Strongly disagree, (2) disagree, (3) somewhat disagree, (4) neither agree nor disagree, (5) somewhat agree, (6) agree, (7) strongly agree, I do not know.

Question 9: The information from close friends and relatives is a reliable reference for my investment decisions.
Answer: (1) Strongly disagree, (2) disagree, (3) somewhat disagree, (4) neither agree nor disagree, (5) somewhat agree, (6) agree, (7) strongly agree, I do not know.

Question 10: While considering whether to invest in a financial asset, I put more weight on its recent performance.
Answer: (1) Strongly disagree, (2) disagree, (3) somewhat disagree, (4) neither agree nor disagree, (5) somewhat agree, (6) agree, (7) strongly agree, I do not know.

Question 11: I avoid investing in profitable assets if I occurred losses in similar investments in the past.
Answer: (1) Strongly disagree, (2) disagree, (3) somewhat disagree, (4) neither agree nor disagree, (5) somewhat agree, (6) agree, (7) strongly agree, I do not know.

Question 12: Suppose you have €1,000 and you have to choose either option A or option B.

Option A: 50% chance of gaining an additional €1,000 and 50% chance of gaining €0

Option B: 100% chance of gaining an additional €500

Answer: Option A, Option B

Question 13: Suppose you have €2,000 and you have to choose either option A or option B.

Option A: 50% chance of losing €1,000 and 50% chance of losing €0

Option B: 100% chance of losing €500

Which option would you choose?

Answer: Option A, Option B.

Question 14: If interest rates rise, what will happen to bond prices (holding all other factors fixed)?

Answer: Will fall, will rise, will remain the same, there is no relation between bond prices and interest rates, I do not know.

Question 15: What is meant by financial diversification?

Answer: Hold stocks and bonds, do not hold the same asset too long, invest in as many assets as possible, allocate capital in a way that reduces the exposure to any one particular asset or risk, avoid high−risk assets, I do not know.

Question 16: Is the following statement true or false? "Buying a single company's stock usually provides a more stable return than a stock mutual fund."

Answer: True, false, I do not know.

Question 17: Suppose you must choose from one of the following three options:

Option 1: receive €100 for sure

Option 2: 50% chance to get €200 and 50% chance to get €0

Option 3: I am indifferent between option 1 and option 2

Which option would you choose?

Answer: Option 1, option 2, option 3

Questionnaire part three

Exit questions

Question 1: Have you ever heard of the phenomenon: "finfluencer" or "financial influencer", which is a person who speaks about investing on social media?
Answer: Yes, No.

Question 2: Have you ever followed up their (finfluencer's) advice? (if response to question 1 is "Yes")
Answer: Yes, multiple times; Yes, but just once; No.

Question 3: How satisfied are you with the investment? (if response to question 2 is "Yes, multiple times" or "Yes, but just once")
Answer: 7-point scale: 1 very dissatisfied – 7 very satisfied.

Question 4: Do you discuss the advice of finfluencers with others? (if response to question 1 is "Yes")
Answer: (1) Never, (2) rarely, (3) sometimes, (4) often, (5) very often.

Question 5: How often do you read posts or watch videos of "finfluencers"?
Answer: (1) Never, (2) once every 6 months, (3) once every 3 months, (4) once every month, (5) once every week (6) daily, (7) several times a day.

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