

Regulatory Certification, Risk Factor Disclosure, and Investor Behavior*

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Abstract

This article examines the question: Does regulatory approval of prospectuses act as a “certification” of securities offerings? Rational investors should generally ignore prospectus approval due to its being uninformative regarding either the quality of, or motives for, the underlying offering. Our survey experiment demonstrates that salient references to regulatory oversight in investment advertisements can lead to significant increases in willingness to invest and concomitant decreases in perceived risks. Conversely, salient disclosure of risk factor information increases risk perceptions and reduces the intention to search for additional information. Various robustness tests confirm that investors can perceive regulatory oversight of securities offerings as an endorsement. Our results provide insight regarding the design of the disclosure and the effective regulation of financial marketing.

JEL classification: G11, G18, D91, M37

Keywords: Salience, Investment behavior, Advertising, Statutory disclosure

Received December 21, 2018; accepted December 9, 2019 by Editor Jules van Binsbergen.

1. Introduction

Securities offerings are characterized by asymmetric information between corporate insiders and the outside investors whose informationally disadvantaged position compromises their ability to assess the credibility of an offering. Two factors, namely publication of regulatory disclosure, and certification by trusted third parties, including bankers, auditors, or certain selling investors (Megginson and Weiss, 1991; La Porta, Lopez-de-Silanes,

* We thank seminar participants at the Dutch Central Bank (DNB), Erasmus University, Tilburg University, the 2016 FMA Annual Meeting, the 2017 FMA Europe Meeting, the 2nd Research in Behavioral Finance Conference, Mark Gabarro Bonet, Rik Frehen, Steffen Meyer, Luc Renneboog, Ronald Verhoeven, Patrick Verwijmeren, Job van Wolferen, and Wille Zijlstra for valuable feedback. Any remaining errors are our own.

and Schleifer, 2006), can help investors to make credible assessments when access to inside information is limited.¹

This article examines whether investors perceive regulators' disclosure of legally required prospectus approval, in the form of simple references in marketing materials, as a form of third-party certification. Although investment marketing is widely used by individual investors for decision-making purposes (Investment Company Institute, 2006), regulatory approval of the prospectus only indicates that minimum disclosure requirements have been met; regulatory prospectus approval is largely uninformative regarding the motives or merits of the offering. The latter qualities are customarily assessed by analysts or underwriters in an equity story. A rational investor should distinguish between these different certification signals, and we should find investors' decisions to be insensitive to the presence of regulatory oversight. We empirically investigate the validity of this claim.

Our first step is to review the specific ways investment advertisements refer to regulatory oversight. In a sample of eighteen advertisements, we find that the majority contain salient references to regulatory oversight and specifically emphasize "approval." Salient references to regulatory oversight can act as a certification of the offering (Gupta, 1997); however, these references can also lower the responsiveness to other attributes competing for attention (Bordalo, Gennaioli, and Shleifer, 2013). In this case, risk factor disclosure would be such an attribute. Therefore, the design of advertising disclosures can help issuers influence investor behavior as well as reduce the cost of newly raised capital. A reduction in the saliency of risk factor information improves the investor's perceptions of the offering and, therefore, increases its probability of success. Consistent with Jones and Smythe (2003), our review confirms that risk factor information tends to be disclosed in fine print sections of the advertisement with low visual saliency.

Next, we conduct a survey experiment in which references to regulatory oversight in advertisements vary in saliency, and in which relevant background information is collected. The treatments are designed in cooperation with the supervision staff of the Dutch financial markets regulator (AFM—the Dutch Authority for the Financial Markets), who then administered the survey. As a result, and despite not being able to provide monetary participation incentives to all respondents, we obtained access to a unique sample of investors active in the primary market. We concede the imperfections inherent in our sample, and further note that relevant alternative research strategies have distinct drawbacks. For example, we could not conduct a field experiment that would necessitate investors' receiving different treatments, as this method would violate the law requiring offering homogeneous information to all investors to ensure a level playing field. Offering different information documents to investors creates liability risks for supervisory authorities or issuing firms. Similarly, cross-sectional or longitudinal field data on retail securities offerings are scarce and typically contain only limited background information on investors.

Our main findings are summarized as follows. First, we find that the treatments are associated with significant increases in willingness to invest (+10%) and decreases in risk

1 In the USA, an S-1 form is filed with the SEC prior to offering securities to the public. Similar legislation applies to European capital markets where regulators assess whether a prospectus is "complete," "consistent," and "understandable" prior to granting approval (Prospectus Directive 2003/71/EU). Exempted offerings are obliged to carry a salient warning of a prescribed size. Finally, prospectuses are approved *prior* to publication, while regulators are only mandated to supervise investment marketing *after* it has been published.

perceptions (−5.9%). The causality of these findings is confirmed in a within-subject-within-offering analysis in which changes in disclosure are regressed on changes in investor responses. Second, salient risk factor disclosure increases (decreases) investors' risk perceptions (search for additional information), but does not affect willingness to invest or amounts invested. Third, we further investigate whether the certification mechanism is affected by investor experience or investor sophistication. These analyses reveal that experienced investors seem to delegate trust to the regulator and, with this evidence of regulatory oversight, are less likely to search for additional information. Additional interaction analysis with education or wealth measures does not generate additional insight regarding sensitivity to regulatory certification. Finally, regulatory certification does not affect the intention to consult the prospectus; however, the demand for additional information seems driven in part by the information provided by the advertisements. This latter finding is consistent with [Mayzlin and Shin \(2011\)](#), who show that advertisements can be designed to invite the consumer to search for additional information.

This article makes a unique contribution to the literature through testing the effect of regulatory certification in investment marketing on investment behavior. We extend the current literature by empirically demonstrating that visual salient disclosure of regulatory certification has a significant effect on investor opinions and thus their intended investment decisions.² Although the impact of saliency of information on investment decisions has received empirical support ([Klibanoff, Lamont and Wizman, 2002](#); [Barber and Odean, 2008](#)), this method of analysis has not heretofore been performed in a regulatory context. Because supervisors have a prominent presence in financial markets, understanding the effect of the externalities of regulatory oversight on investor behavior and, ultimately, on securities prices, is crucial. We also document a new channel of certification by third parties in securities offerings. Although previous contributions have examined third-party certification by market parties such as (i) the presence of private equity investors ([Megginson and Weiss, 1991](#)); (ii) prominent strategic partners ([Stuart, Hoang, and Hybels, 1999](#)); and (iii) the composition of the underwriting syndicate ([Booth and Smith, 1986](#)), the presence of regulators has until now been neglected. Although regulatory oversight may provide basic assurance for the intentions or quality of an issuer or offering, our study documents large effects in comparison to the risk of, for example, a scam.

Our use of a survey experiment also allows for an analysis at the individual investor level, thereby enabling us to correct for confounding factors. Even absent field data, our certification findings corroborate those established with event studies ([Gupta, 1997](#)). Moreover, our data set is representative of the (Dutch) investor population, which allows us to examine the extent of investor sensitivity to regulatory certification. Further, the availability of background information informs how sensitivity varies with investor sophistication. To the best of our knowledge, we are the first researchers to conduct an empirical examination at this level of detail.

A further contribution entails our studying offerings specifically targeted toward retail investors. Existing studies often cover the offerings that receive substantial external attention from media and analysts ([Da, Engelberg, and Gao, 2011](#); [Solomon, Soltes, and Sosyura, 2014](#)). These deals are typically underwritten by, or distributed through, prominent channels such as investment banks or wealth managers, in which case they receive

2 See [Loughran and McDonald \(2013\)](#); [Lawrence \(2013\)](#); [Beshears et al. \(2011\)](#); and [Choi, Laibson, and Madrian \(2010\)](#) for empirical disclosure research.

implicit certification regardless of the presence of regulatory oversight. Retail offerings are a small but important niche in the capital market, because they are characterized by high asymmetric information between issuers and investors. They are also customarily sold without the intervention of trust-enhancing intermediaries, while fraudulent retail investment offerings attract substantial media attention and consequently drive public opinion regarding the integrity of the capital market and the effectiveness of its regulators. Finally, external analysts provide only limited coverage of retail offerings, which limits availability of information outside the direct control of the issuing firm. Therefore, regulatory certification can provide an important credibility signal to investors. Our study examines the specific segment of the capital market where these factors are likely to be most significant.

From a policy perspective, our findings provide important insights into the effects of financial markets regulation. Individual investors rely heavily on marketing materials for decision-making purposes and forgo consulting the prospectus (SEC, 1983; Investment Company Institute, 2006; SEC, 2009). However, marketing materials tend to be supervised following publication, and their content is less regulated in comparison to the prospectus, which is approved prior to publication. This difference creates an opportunity for issuers to frame information on regulatory oversight toward certification in order to let an offer succeed. Framing of this kind comes at the expense of conflicting with the interests of investors, who bear increasing responsibility for the welfare impact of costly investment mistakes. Moreover, regulatory approval may be used as a stand-alone decision criterion, in which case financial market supervision can reduce the quantity of fundamental information ultimately reflected in investment decisions. Finally, the increased regulation of financial markets, especially following the Global Financial Crisis, implies that the side-effects of regulatory oversight are more widespread than previously thought. An example is the SEC's designation of credit rating agencies (CRAs) as nationally recognized statistical rating organizations (NRSROs) following the Credit Rating Agency Reform Act of 2006. This act imposed stricter requirements for obtaining the NRSRO designation, thereby raising the question whether ratings by regulated NRSROs should merit investors' trust to a greater degree than would ratings by institutions without this designation.

The presence of regulatory externalities further raises the questions: Whether, and how, can regulations be reformed to reduce them? Framing of regulatory oversight may be reduced by a stricter regulation of references, such as harmonization. Although this action could eliminate the discriminatory value, it would not alleviate the risk of regulatory approval's being a stand-alone decision heuristic for investors. Consequently, investors may perceive a disadvantage in offerings exempted from the prospectus regulation.³ Two possible factors may mitigate the heuristic effect: one, if investors are better informed about the roles and tasks of regulatory authorities; or two, by elimination of exemptions to the prospectus regime such that all offerings are treated at par from a regulatory perspective. However, both interventions create new regulatory costs, such as those of educating investors and supervising a larger number of offerings. As a result, new barriers to entry in the capital markets may arise. Finally, the decision to intervene should be driven by an assessment of

3 Various exemptions apply to the requirement to publish a prospectus including the number of investors that the securities are offered to (150 investors or fewer), the nominal value of the securities (more than €100,000), and the size of the offering (less than €2.5 million). The majority of exempted offerings use the €2.5 million exemption.

the costs of compliance and supervision against the welfare losses, if any, sustained in the current situation. This detailed analysis is beyond the scope of this article.

This article continues with an overview of the literature, and hypotheses development, in Section 2, followed by a discussion of the design of the study in Section 3. Our empirical findings are contained in Section 4. Section 5 discusses our findings and Section 6 concludes.

2. Literature Review and Hypothesis Development

Disclosure laws reduce the information asymmetry between investors and corporate insiders in capital-raising activities by requiring the publication of a detailed disclosure regarding a given securities offering. However, the disclosure in prospectuses tends to be extensive and complex (Investment Company Institute, 2006), and individual investors are limited in the quantity and complexity of information they can effectively process (Van Rooij, Lusardi, and Alessie, 2011; Lawrence, 2013). As a result, investors rely heavily on alternative sources of information such as advertisements and roadshow materials, in which information is more accessible but is not comprehensive.

The typical appeal of advertising to investors is the concise and attention-grabbing format of the information. Despite the advertisements' acknowledged dual purpose of informing and attracting attention, they are not legally required to contain all relevant information regarding a product or offering. This condition implies that issuing firms can choose the information they include in advertisements and thereby make salient to investors. Prior studies show that marketing affects investment decisions because it increases the saliency of the advertised firm. Barber and Odean (2008) show that media coverage directs investor attention to salient securities and causes a temporary increase in investor demand for stocks covered in the news. Similarly, Solomon *et al.* (2014) find that mutual funds covered in the media attract flows from investors in contrast to holdings not covered in major newspapers. Moreover, media coverage also tends to contribute to returns-chasing behavior. Lou (2014) provides evidence that managers adjust firm advertising to attract investor attention and influence short-term stock returns. He shows that increased advertising spending correlates with an initial rise in retail buying and positive abnormal stock returns followed by lower future returns. A theoretical model explaining these empirical findings is developed in Bordalo *et al.* (2013), who show that salient information attains a greater weight in subsequent decision-making compared to nonsalient attributes. However, the studies described above focus on advertising and media coverage of the mutual fund sector rather than initial public offerings targeted to retail investors, for which such an analysis is lacking.

In addition to the saliency of firms and information created by advertisements and disclosure, (salient) third-party certification can provide valuable signals about the quality of an offer and the intentions of an issuer in the presence of asymmetric information. The certification channel acts through the reputation, activities, or intentions from third parties, including the composition and reputation of underwriting syndicates in securities offerings. Booth and Smith (1986) demonstrate that the reputational capital of the underwriting syndicate in an IPO affects IPO underpricing and announcement effects, and thereby acts as a certification mechanism. Similarly, Megginson and Weiss (1991) show that the presence of selling venture capital shareholders in IPOs results in significantly lower initial returns and less underpricing compared to non-VC-backed deals. The total costs of going public are

lowered by the presence of venture capitalists and thereby maximize the net proceeds to the offering firm. Both studies show the existence and economic importance of third-party certification effects in securities offerings.

Another paper closely related to ours is [Gupta \(1997\)](#), who investigates regulatory certification effects by conducting an event study using a sample of bank bailouts approved by the Federal Deposit Insurance Corporation (FDIC). Gupta finds that acquirers of failed banks who obtain prior regulatory approval by the FDIC have acquirer gains exceeding the size of the acquired deposit base. This finding indicates that FDIC approval provides valuable information regarding the financial health of the acquirer. Moreover, the documented effects increase in periods of economic turmoil, when uncertainty about the health of financial institutions increases. Certification effects are not confined to securities offerings or takeover bids, but are also present in the market for credit ratings, where credit rating agencies (CRAs) analyse the credit risk of fixed-income securities. [Boot, Milbourn, and Schmeits \(2006\)](#) show that individual investors mimic the decisions of institutional investors, who in turn follow credit ratings. In this case, the investment decisions are certified by a combination of large investors and CRAs. Similarly, [Bongaerts, Cremers, and Goetzmann \(2012\)](#) demonstrate empirically the existence of “regulatory certification,” in which a third rating agency determines whether a bond is classified as investment grade and high yield, or relegated to junk status.

Overall, extant finance literature documents that the saliency of information is an important driver for investment behavior, and the presence of third-party certification is an important piece of information, which can be made salient. However, the existing literature has assessed such effects generally from a market-level perspective for certification by other market parties. Our article contributes to the literature on the two following dimensions: one, via analyzing the effects of certification at the individual investor level; and two, via testing certification by a public body. Although NRSROs are also certified by a public body, namely the SEC, we are not aware of empirical work that analyses the impact on individual investor behavior.

We therefore investigate the following hypotheses. First, we expect that salient regulatory certification has a positive influence on investor perceptions surrounding an offering and decreases the perceived riskiness of the offering.⁴ Moreover, we expect regulatory certification to increase the willingness to invest, as well as the specific amounts invested and the intention to search for additional information. With respect to the latter, we note that the direction of the effect is ambiguous. If investors believe that the availability of certified information is sufficient for an investment decision, then the investor may require less additional information, resulting in a small effect or no effect. However, as noted previously, investment marketing only contains a subset of information; therefore, a rational investor would still require additional information after having read the advertisement. In this case, certification can increase awareness about prospectus availability, and subsequently affect investors’ intentions to and the number of investors that search for additional information. Overall, we formulate the first set of hypotheses as follows:

Hypotheses 1: Regulatory certification: (a) decreases perceived riskiness; (b) increases willingness to invest; (c) increases the average amount invested; (d) positively affects the intention to

4 Note that this claim assumes the regulator holds a positive image among the investment audience.

search for additional information; and (e) increases the inclination of investors to search for additional information.

Next, we examine how risk factor disclosure affects investors. Although regulations require risk information to be included in advertisements, this information can be disclosed with low visual or verbal saliency (Jones and Smythe, 2003). Bertrand *et al.* (2010) find that minor differences in verbal saliency can significantly affect consumer demand. Therefore, we expect the risk perception of potential investors to be sensitive to the verbal (e.g., including the word “risk” in risk factor descriptions) and visual saliency (e.g., disclosure in fine print) of risk factor disclosure. How saliency of risk-factor disclosure affects information search behavior remains ambiguous. If the advertisement spurs investors’ curiosity, then search efforts might increase; however, if investors lose interest in the offering, then a negative effect is probable. The saliency of risk-factor disclosure also affects its weight in subsequent decisions (Bordalo *et al.*, 2013). Consequently, we expect that increasing (decreasing) the relative saliency of risk attributes decreases (increases) the appeal of the offering; decreases (increases) the willingness to invest; and increases (decreases) risk perceptions. These arguments lead us to formulate the second set of hypotheses as follows:

Hypotheses 2a/b: Explicit verbal and visual disclosure (a) increases perceived riskiness; (b) decreases willingness to invest; (c) decreases the average amount invested; (d) ambiguously affects the intention to search for additional information; and (e) ambiguously affects the inclination of investors to search for additional information.

As explained in the introduction, we conduct a survey experiment instead of a field experiment for legal reasons. We aim to maximize the external validity of our approach through random assignment of respondents and the development of realistic treatments. A more extensive discussion of the external validity of our findings is included in the discussion section. The next section develops a detailed description of our research design.

3. Research Design

3.1 Design of the Advertisement

The advertisements for the hypothetical securities offerings used in this article have been designed in collaboration with the Dutch financial markets regulator (AFM) to assure their resemblance to actual offerings. Using hypothetical offerings has several advantages: First, they are not traceable to actual offerings in the market, thereby obviating (regulatory) secrecy issues. Second, hypothetical offerings reduce the risk of responses being contaminated by unobserved past experiences or familiarity with the offering. Third and finally, hypothetical offerings are necessarily exempt from concurrent media attention that could confound our results.

We create our advertisements based on a review of eighteen actual offering advertisements for which an approved prospectus has been published. These advertisements were published on popular investor websites as well as in a major Dutch financial newspaper that also contains advertisements for prospectus-exempt offerings. Since the two channels attract a diverse readership including both retail and professional investors, we contend that our sample of advertisements is representative of those encountered by typical Dutch retail investors. We develop two one-page advertisement templates, and include layout

features from actual advertisements. Both templates are included in Figures A.I and A.II of the [Online Appendix](#).

Next, we analyze the disclosure in the advertisements using [Resnik and Stern's \(1977\)](#) framework to identify “informational cues.” These informational cues are pieces of information likely to affect investor behavior. Cues include (i) price (nominal amount or price of a bond or stock); (ii) quality (experience of the fund manager or qualities of the underlying asset); (iii) performance (track record, historical performance, or expected returns); (iv) guarantees (guaranteed repayments of the bond principal); and (v) safety information (risks associated with an investment and the presence of regulatory oversight). Unsurprisingly, we find that performance (returns) and safety cues (reference to regulatory oversight) are included in all of the advertisements.⁵ Risk-factor disclosure is also part of all the advertisements, but typically disclosed with low verbal (e.g., vaguely worded) or visual (e.g., in fine print) saliency. Consider as an example the description of liquidity risk. A portion of advertisements describe this risk factor as “*limited possibilities* to trade your securities,” while a more straightforward description would be “*liquidity risk* means that you *risk* not being able to trade your securities” [emphasis added]. The former description is less salient to retail investors. Similarly, we find that favorable attributes, such as returns, are presented in colored and attention grabbing box formats, which increases their relative visual saliency.

We then constructed two bond offerings that mimic actual offerings: one for a food market fund (A), and one for a sports fund (B). As a result, we offered a fixed-rate coupon bond with a denomination of €1,000, a 4-year (A) or 4.5-year (B) maturity, and an annual coupon of 7.2% (A) or 7.6% (B). Because these propositions are typically highly levered, high coupon rates were offered to compensate for the default risks. Further, because exceptionally high coupon rates raise suspicion, we verified that our rates were equivalent to (risky) SME bond yields ([Zank, Schilz, and Bund, 2015](#)). Note that these bonds have been issued at face value and not via a book-building procedure such that the initial yields are equal to the coupon rates. Thus, the success of the offering would depend solely upon the amount of successfully placed securities and not upon their price.

In the last step, we drafted eight different Dutch advertisements, four for each bond-offering template. The header and shrouded sections of the advertisement contain contextual and risk factor information alongside a reference to regulatory oversight of the prospectus. This information was kept constant across advertisements. We used a salient section to increase the visual saliency of information regarding the presence of regulatory oversight and risk factors. Since our panel consisted of Dutch investors, we presented them with advertisements in Dutch and provide English translations in Table A.I (sports fund) and Table A.II (food market) of the [Online Appendix](#).

The sports fund advertisement alternatives (Figure A.III–Figure A.VI in the [Online Appendix](#)) vary the amount of *visually* salient risk factors included in the salient section of the advertisement and are referred to as the *Balanced Information* treatment. The food market advertisements (Figure A.VI–Figure A.X in the [Online Appendix](#)) vary the *verbal* saliency of the risk factor descriptions (e.g., using the word “risk”) and we refer to this treatment as *Explicit Risk Disclosure*. Both offerings contain references to regulatory certification and we refer to this treatment as *Regulatory Certification*.

5 Note that although all investors may not have known the transcription for AFM, i.e., Dutch Authority for the Financial Markets, we refrained from transcribing the acronym, to remain consistent with usage in actual advertisements.

Note that differences in coloring and other changes can also affect investor behavior (Kliger and Gilad, 2012). However, we faced a trade-off between keeping the experimental conditions constant and creating advertisements that attract a sufficient amount of attention. Therefore, the different color schemes for the food market and sports fund advertisements are based on existing advertisements. Furthermore, fund manager experience has been included in some of the sports fund advertisements in order to present the same number of characteristics in the salient section as in other advertisements (see Figure A.V and A.VI in the [Online Appendix](#)).⁶ These changes lead to small deviations from the *ceteris paribus* condition, yet they have ensured that the advertisements remain realistic and in line with current (interpretations of) regulations.

3.2 Design of the Survey Experiment

Respondents read a brief introductory text and then began the experiment. They clicked to view the first of three randomly assigned advertisements, each of which was followed by a brief four-question survey discussed below. We imposed two conditions on the assignment of advertisements. First, we required that respondents encounter advertisements for both propositions, and second, we required the first and third advertisements to be different advertisements for the same proposition. The first condition was imposed to obviate the possibility that investors would ignore information by incorrectly assuming that they previously saw the same advertisement, while the latter condition created within-respondent-within-offering variation in disclosure allowing for a difference-in-differences analysis. The graphical setup of the experiment is presented in [Figure 1](#).

We imposed no restrictions on the time that respondents could spend reading the advertisement, and we measured their viewing time until they began the questionnaire. Respondents answered survey questions one at a time, and were unable to click back to the advertisement or to previous questions, to prevent look-up behavior or changes to initial answers.

The four questions that respondents addressed measure the following: (i) willingness to invest; (ii) amount invested from a hypothetical €25,000 endowment; (iii) inclination to search for other information; and (iv) perceived riskiness of the offering (see questionnaire in [Appendix](#)). We adopted question formats and measurement scales from [Aydogdu and Wellman \(2011\)](#) and [Miyazaki and Krishnamurthy \(2002\)](#). To mitigate response noise, the survey was designed in order that only those participants expressing interest in the offering, via a response of three or higher on the willingness to invest question, were then asked to indicate their hypothetical investment sum.⁷ After the third round, we also asked two exit questions about the respondents' primary market investment experience and their inclination to read the statutory prospectus (see the [Appendix](#)).

6 Fund manager experience is also included in the shrouded section of the advertisement. While this does not yield a perfect *ceteris paribus* condition, a comparison of mean responses between [Online Appendix](#) Figures A.V and A.VI reveals that they remain consistent with the regulatory certification hypothesis.

7 Our results are not sensitive to this cutoff point. The response distribution of the willingness to invest question is homogeneous between Answer Categories 3, 4, and 5, and a moderate correlation exists between willingness to invest and amount invested ($\rho = 0.15$). These findings indicate that our results are not driven by the cutoff value.

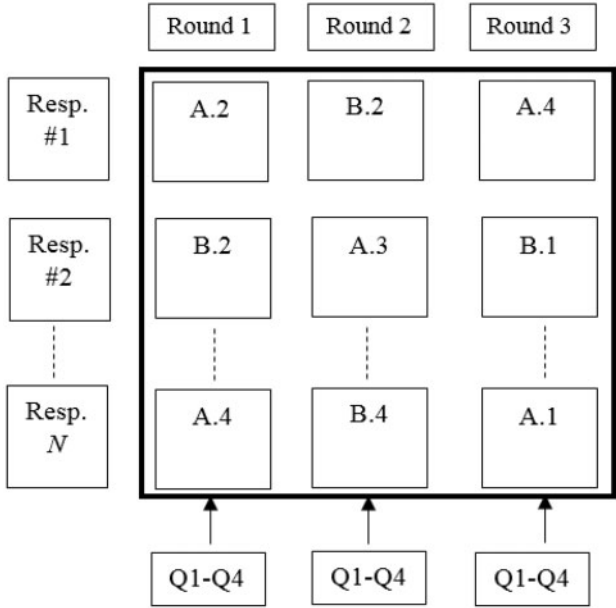


Figure 1. Schematic overview of the experimental design. The experimental procedure randomly confronts respondents consecutively with three advertisements each followed by a four-question survey (denoted by Q1–Q4). Respondents randomly encounter one of four advertisements (denoted by 1–4) for the food market (denoted by A) or sports fund proposition (denoted by B) per round. We impose the condition that: (1) the second round advertisement is a different proposition than the first round advertisement (e.g., A followed by B) and (2) that the *third* round advertisement is a different alternative compared to the *first* round (e.g., one followed by three). As an example, Respondent #2 views sports fund alternative two (B.2) in the first round, food market alternative three (A.3) in the second round, and sports fund alternative one (B.1) in the third round. The allocation of respondents to advertisements is independent of their origination source. The questionnaire is provided in the Appendix and the advertisements are present in the [Blue Appendix](#).

The experiment was administered online in May 2015, by a specialized marketing research bureau, to a panel of Dutch investors with heterogeneous experience levels. The demographic data of the respondents were collected when they enrolled in the panel and not collected again in this study. Our data consist of individuals who volunteered to enroll in the panel, and a random sample obtained from a large panel operated by the marketing research bureau (hereafter MRB). The latter group is more representative of the Dutch population. Respondents were informed that the AFM was involved in the study, which created a risk that only those respondents who hold positive views about the regulator would choose to participate. Unfortunately, we were unable to reliably control for these perceptions, and we acknowledge the potential for upward bias in the regulatory certification effect. However, these effects should be weaker for the MRB respondents, who were sourced from an external panel.

Respondents from the marketing research bureau also received monetary compensation for their participation in the study, while the voluntarily enrolled respondents participated in a semiannual lottery to win a lunch with AFM’s CEO. Although volunteers received no monetary participation for their participation, we note that lottery-type incentives have

been used in similar studies (Kozup, Howlett, and Pagano, 2008; Elliott, Rennekamp, and White, 2015). Since the heterogeneous composition of our sample also affects awareness of regulatory duties, we include origin dummies in all of the regressions to control for these effects.

4. Empirical Results

4.1 Descriptive Statistics

Of the 1,840 invitations distributed by email, 1,125 respondents completed the experiment, which corresponds to a response rate of 61.1%. Ten respondents spent more than 1,000 seconds to view one or more of the advertisements and we treat those observations as outliers and winsorize them to 1,000 seconds. This does not affect our results.

We present the demographic characteristics in Table I and find that our sample is primarily composed of married men (80.1%) without children living at home (54.5%). Nearly 85% of the respondents are age 45 years or above and 31.2% earn an income at least double that of the Dutch median (€66,000 in 2015). The amount of wealth available for financial investments exhibits a U-shape with relatively few observations between €25,000 and €80,000. In line with the high average age of our respondents, Table I indicates that 40% of them are retired, while the majority of nonretired respondents are regularly employed (29.1%).

Examining differences across subsamples reveals that the marketing research bureau respondents are, on average, younger (55% are less than 60 years old), and report less wealth and lower income. Moreover, they are less likely to be entrepreneurs (6.0%) compared to the volunteer respondents (21.1%). Note that our sample is not representative of the Dutch population as a whole, but shares similar characteristics to studies using representative Dutch survey data (Gaudecker, 2015).

Descriptive statistics on the response variables are provided in Table II, in which Panel A contains the *Explicit Risk Disclosure* treatment (N = 562), Panel B covers the *Balanced Information* treatment (N = 563), and Panels A and B both contain the *Regulatory Certification* treatment. Clear differences emerge across all treatment conditions while being strongest for the regulatory certification effect. For ease of comparison, we provide aggregated responses at the treatment group level in Panel C, and significant differences in means are bolded.

Consistent with our hypotheses, we find that the presence of the visually salient regulatory certification reduces perceived risk (−6.4%) and increases willingness to invest (+10.2%). No significant differences in investment amounts are observed as a result of the relatively low average interest in the offering. This leads, by construction, to a lower number of observations for the amount invested question (N = 254). We also find that the amount invested responses deviate from the €1,000 nominal bond value, which could indicate that the respondents failed to understand the mechanics of these investments or did not carefully read the advertisement.⁸ We control for the latter in a robustness analysis by adding analysis time as an additional explanatory variable.

Inclusion of the verbally salient risk factor descriptions increases the average risk perceptions by 5.1% and reduces the willingness to consult other information by 6.8% (see

8 Although we ran all of the regressions on the subsample of respondents who spent at least 30 seconds reading the advertisement, the results do not affect our results.

Table 1. Demographic and socioeconomic descriptive statistics

This table contains the demographic and socioeconomic characteristics of the complete data set, as well as the voluntary enrollment and marketing research bureau subsamples. All variables are measured as dummies.

	Total sample		Voluntary enrollment		Marketing research bureau	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Male	80.1%	39.9%	87.0%	32.3%	76.3%	42.5%
Single w/o children	20.2%	40.0%	15.6%	35.8%	21.8%	41.3%
Single w/ children	2.2%	14.7%	1.8%	13.4%	2.4%	15.3%
Spouse w/o children	54.5%	49.8%	55.6%	49.7%	54.5%	49.8%
Spouse w/ children	21.6%	41.2%	24.1%	42.1%	20.2%	40.2%
Other	1.6%	12.6%	2.9%	16.3%	1.1%	10.5%
Age ≤ 30 years	1.3%	11.5%	0.5%	5.1%	1.7%	12.9%
Age 31 ≤ 45 years	11.1%	31.5%	10.8%	30.6%	11.3%	31.7%
Age 46 ≤ 60 years	36.2%	48.1%	33.4%	46.4%	38.1%	48.6%
Age 61 ≤ 75 years	42.8%	49.5%	45.2%	48.2%	41.2%	49.2%
Age > 75 years	5.5%	22.8%	6.8%	25.2%	4.6%	21.0%
Income ≤ €12,500	2.0%	14.2%	0.7%	5.8%	2.7%	16.1%
Income € 12,501 ≤ €26,500	8.3%	27.6%	4.2%	17.9%	10.3%	30.4%
Income € 26,501 ≤ €33,000	8.6%	28.1%	7.0%	25.2%	9.3%	29.0%
Income € 33,001 ≤ €39,500	10.7%	31.0%	8.8%	28.0%	11.4%	31.8%
Income € 39,501 ≤ €66,000	27.2%	44.5%	22.8%	41.8%	28.8%	45.3%
Income € 66,000 ≤ €78,500	10.5%	30.7%	11.4%	31.7%	10.5%	30.7%
Income > € 78,500	20.7%	40.5%	29.6%	45.4%	17.0%	37.6%
DK income	11.9%	32.4%	15.6%	36.3%	10.1%	30.2%
Household wealth ≤ € 10,000	17.8%	38.2%	9.9%	26.9%	21.9%	41.4%
Household wealth € 10,000 ≤ €25,000	11.1%	31.4%	7.5%	23.2%	12.2%	32.8%
Household wealth € 25,001 ≤ €50,000	13.6%	34.3%	9.0%	27.9%	15.9%	36.6%
Household wealth € 50,001 ≤ €80,000	8.6%	28.1%	7.4%	26.1%	9.1%	28.8%
Household wealth € 80,001 ≤ €150,000	10.5%	30.7%	9.7%	29.7%	11.0%	31.3%
Household wealth > €150,000	22.0%	41.5%	37.8%	46.6%	14.7%	35.5%
DK household wealth	16.3%	37.0%	18.7%	39.1%	15.2%	35.9%
Primary school/lower vocational studies	10.2%	30.3%	8.1%	26.7%	11.1%	31.4%
High school/middle vocational studies	29.1%	45.4%	19.0%	39.4%	34.8%	47.7%
College/university level education	60.7%	48.9%	72.9%	44.6%	54.1%	49.9%
Entrepreneur	10.2%	30.3%	18.5%	38.8%	6.0%	23.8%
Employee	29.1%	45.4%	26.7%	42.4%	31.6%	46.5%
Government employee	5.3%	22.5%	2.5%	13.6%	6.6%	24.8%
Employment disabled	6.4%	24.5%	3.9%	17.2%	7.3%	26.0%
Unemployed	4.1%	19.8%	2.3%	13.2%	4.8%	21.3%
Retired	40.2%	49.1%	41.4%	47.2%	39.0%	48.8%
Student	0.1%	4.2%	0.0%	0.0%	0.3%	5.3%
House(wo)man	2.5%	15.6%	2.1%	12.7%	2.8%	16.5%
Other	1.9%	13.9%	2.6%	15.6%	1.5%	12.3%
Number of observations	1,125		413		712	

Table II. Descriptive statistics by treatment conditions

This table presents the means and standard deviations of the first round responses across treatment conditions: regulatory certification (both panels), explicit risk disclosure (Panel A), and balanced information (Panel B). Panel C reports the mean values across the treatment groups and indicates *p*-values ≤ 0.05 for the two-sided differences-in-means tests in bold. *Risk Perception* (Question 4) is measured on a seven-point scale ranging from 1 “not risky at all” to 7 “very risky.” *Willingness-to-invest* (Question 1) is measured on a seven-point scale ranging from 1 “certainly not investing” to 7 “certainly investing.” *Consult Other Information* (Question 2) is measured on a seven-point scale ranging from 1 “certainly not consulting other information” to 7 “certainly consulting other information” and *Amount Invested* (Question 3a) is measured on a continuous scale ranging between €0 and 25,000. *Analysis Time* is the number of seconds the respondent spent reading the advertisement. The questionnaire can be found in the Appendix.

Panel A: Regulatory certification and explicit risk disclosure (food market)

	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
Regulatory certification:	Yes		No		Yes		No	
Explicit risk disclosure:	No		No		Yes		Yes	
	Avg.	Std.	Avg.	Std.	Avg.	Std.	Avg.	Std.
Risk perception	5.1	1.5	5.5	1.3	5.3	1.3	5.8	1.2
Willingness-to-invest	2.4	1.6	2.3	1.4	2.4	1.5	2.0	1.3
Amount invested	€ 6.722	€ 4.356	€ 5.844	€ 5.791	€ 7.000	€ 3.642	€ 7.083	€ 5.532
Consult other information	5.2	2.5	5.2	2.5	5.0	2.5	4.7	2.6
Analysis time	53.3	41.2	60.7	66.4	58.5	78.9	62.5	104.3
Number of observations	141		141		140		140	

Panel B: Regulatory certification and balanced information (sports fund)

	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
Regulatory certification:	Yes		No		Yes		No	
Balanced information:	Yes		Yes		No		No	
	Avg.	Std.	Avg.	Std.	Avg.	Std.	Avg.	Std.
Risk perception	5.3	1.2	5.7	1.3	5.4	1.4	5.5	1.3
Willingness-to-invest	2.2	1.4	2.0	1.3	2.4	1.6	2.3	1.5
Amount invested	€ 6.550	€ 4.288	€ 5.574	€ 4.887	€ 6.500	€ 4.900	€ 4.910	€ 3.638
Consult other information	4.8	2.5	4.8	2.7	5.2	2.4	5.4	2.4
Analysis time	60.7	120.1	61.2	93.7	53.2	36.4	47.9	33.8
Number of observations	141		141		141		140	

Panel C: Mean responses across treatment conditions (p-values < 0.05 indicated in bold)

Treatment condition:	Regulatory certification		Explicit risk disclosure		Balanced information	
	Yes	No	Yes	No	Yes	No
Risk perception	5.27	5.63	5.56	5.29	5.50	5.46

(continued)

Table II. Continued

Panel C: Mean responses across treatment conditions (p-values < 0.05 indicated in bold)

Treatment condition:	Regulatory certification		Explicit risk disclosure		Balanced information	
	Yes	No	Yes	No	Yes	No
Willingness-to-invest	2.35	2.14	2.20	2.36	2.10	2.33
Amount invested	€ 6,687	€ 5,768	€ 7,035	€ 6,330	€ 6,169	€ 5,715
Consult other information	5.04	5.02	4.84	5.19	4.79	5.32
Analysis time	56.4	59.7	60.5	60.3	50.5	61.0
Number of observations	563	562	280	282	282	281

Panel C) compared to the reference group who received more vaguely described disclosure. Although the former result is consistent with our hypotheses, the latter seems to indicate that the respondents were either no longer interested in the proposition or believed they were sufficiently informed. Furthermore, the visually salient presentation of the risk factors (Panel B) significantly reduces the willingness to invest and search for additional information (Panel C). Again, this finding is consistent with our hypothesis that increasing the saliency of the undesirable attributes decreases the attractiveness of the offering.

4.2 Multivariate Regression Analysis

We conduct OLS regressions and include control variables based on [Van Rooij et al. \(2011\)](#) due to the similarity in data and research questions. Our model includes controls for demographics (age, family situation, education, gender, and labor market position); financial characteristics (income and wealth); and the type of respondent and the offering. Condensed regression results are reported in [Table III](#).

Panel A indicates that regulatory certification indeed decreases risk perceptions by 5.6%, while increasing the willingness to invest and the amount invested by 10.3% and €1,029, respectively. We obtain marginal effect sizes by dividing the regression coefficient by the average response for the nontreated control group (see [Table II](#) Panel C). As indicated, smaller sample sizes for the amount invested model are caused by the design of the survey, due to only interested participants having been asked to indicate an amount. Overall, our results indicate that regulatory certification has a significant impact on invest-or behavior.

The magnitude of the effects also indicates that regulatory certification carries greater weight in decision making relative to the risk factor information. Although verbal salience of risk factors (*Explicit Risk Description*) increases risk perceptions by 4.3% and decreases the intention to search for additional information by 7.3%, these effects are less significant (compare [Table III](#) Panel A with Panel B). Finally, Panel C reports that increasing the visual saliency of the risk factor disclosure decreases investors’ willingness to search for additional information by 9.7%.

It is unclear why the effect of risk factor disclosure is smaller, as it is a key input for investment decisions. One explanation is that the presence of regulatory oversight reduces investors’ sensitivity to other information contained in the advertisement. If investors only screen for the presence of regulatory oversight, then merely changing the saliency, which is included in every advertisement, would result in smaller effects. We test this explanation by estimating the interaction between regulatory certification and risk disclosure in [Table III](#)

Table III. Multivariate regression analysis of first round responses

This table contains the results for the OLS regressions. The dependent variables are *Risk Perception* (Question 4) measured on a seven-point scale ranging from 1 “not risky at all” to 7 “very risky,” *Willingness-to-invest* (Question 1) measured on a seven-point scale ranging from 1 “certainly not investing” to 7 “certainly investing,” *Consult Other Information* (Question 2) measured on a seven-point scale ranging from 1 “certainly not consulting other information” to 7 “certainly consulting other information,” and *Amount Invested* (Question 3a) measured on a continuous scale ranging between €0 and 25,000. The questionnaire is contained in the Appendix. Panel A includes a dummy variable, *Regulatory Certification*, that is equal to one if a salient reference to the regulator is included in the advertisement and zero otherwise. Panel B includes a dummy variable, *Explicit Risk Disclosure*, that is equal to one if the risk description contains the word “risk” and zero otherwise. Panel C includes a dummy variable, *Balanced Information*, that is equal to one if risk disclosure is included in the salient section of the advertisement and zero otherwise. Panel D includes the interaction between *Explicit Risk Disclosure* and *Regulatory Certification*, while Panel E includes the interaction between *Balanced Information* and *Regulatory Certification*. First round responses are used and the control variables are listed in Table I. Robust *t*-statistics are reported in brackets. Significance is indicated by ***, **, and * at the 1%, 5%, and 10% levels, respectively.

	Risk perception	Willingness- to-invest	Amount invested	Consult other information
Panel A: Regulatory certification treatment				
Regulatory certification	−0.319*** [−4.01]	0.222** [2.55]	1029.5* [1.74]	0.097 [0.66]
Control variables	Yes	Yes	Yes	Yes
Number of obs	1,125	1,125	254	1,125
R ²	0.07	0.07	0.12	0.08
F-statistic	23.89	2.89	1.61	3.48
Panel B: Explicit risk disclosure treatment				
Explicit risk disclosure	0.227* [1.96]	−0.142 [−1.15]	820.2 [0.69]	−0.379* [−1.80]
Control variables	Yes	Yes	Yes	Yes
Number of obs	562	562	121	562
R ²	0.11	0.10	0.27	0.11
F-statistic	2.68	2.40	119	2.66
Panel C: Balanced information treatment				
Balanced information	0.089 [0.78]	−0.179 [−1.45]	917.9 [0.92]	−0.517** [−2.40]
Control variables	Yes	Yes	Yes	Yes
Number of obs	563	563	133	563
R ²	0.08	0.11	0.24	0.11
F-statistic	13.79	2.36	1.67	2.62
Panel D: Interaction analysis explicit risk disclosure × regulatory certification				
Explicit risk disclosure × regulatory certification	−0.039 [−0.17]	0.233 [0.91]	−1,079.0 [−0.56]	0.363 [0.88]

(continued)

Table III. Continued

	Risk perception	Willingness-to-invest	Amount invested	Consult other information
Explicit risk disclosure	0.271* [1.80]	−0.267* [−1.70]	1,075.7 [0.73]	−0.543** [−1.98]
Regulatory certification	−0.488*** [−2.96]	0.222 [1.22]	445.0 [0.33]	0.080 [0.27]
Control variables	Yes	Yes	Yes	Yes
Number of obs	562	562	121	562
R ²	0.15	0.12	0.34	0.13
F-statistic	3.72	2.66	1.12	2.58
Panel E: Interaction analysis balanced information × regulatory certification				
Balanced information × regulatory certification	−0.252 [−1.11]	0.311 [1.23]	−1,101.4 [−0.61]	0.316 [0.75]
Balanced information	0.214 [1.32]	−0.331** [−1.97]	1,227.6 [0.90]	−0.669** [−2.22]
Regulatory certification	−0.014 [−0.08]	−0.079 [−0.42]	1311.9 [1.16]	−0.295 [−1.01]
Control variables	Yes	Yes	Yes	Yes
Number of obs	563	563	133	563
R ²	0.10	0.12	0.30	0.12
F-statistic	8.97	2.16	1.02	2.67

Panels D and E and find similar results. The magnitude of the risk disclosure treatments increases in the absence of regulatory certification, thereby indicating that investors become less sensitive to risk factor disclosure once regulatory certification is saliently disclosed in the advertisements.

Another explanation is that the presence of regulatory oversight increases the hurdle for attention to risks while the sensitivity to other offering information (e.g., returns) increases. Sensitivity to (past) returns has received extensive empirical support in the literature (Sirri and Tufano, 1998; Ivkovic and Weisbenner, 2009); if investment decisions are only driven by a subset of information then the factors driving actual decisions (e.g., returns) and perceptions (e.g., risks) may diverge.

In the following sections, we examine how sensitivity to regulatory certification varies with investors' sophistication and experience (Section 4.3). We also test the contribution of advertising content to use of the prospectus (Section 4.4), and establish the causal interpretation of our findings in a within-respondent-within-offer analysis in Section 4.5. Finally, we test the sensitivity of our results to model specification and selection bias in Section 4.6.

4.3 Analysis of Investor Characteristics

We first analyze the sensitivity of our findings to the different origins of our respondents. As previously noted, the origin of the investor proxies for participation incentives and awareness of and familiarity with regulatory duties. If only those respondents who held a positive impression of the regulator completed the survey, then we would expect different

certification effects between the voluntary enrollment and marketing research bureau subgroups. We conduct interaction analysis in Table IV to assess the importance of these effects, in which the voluntary enrollment group serves as the reference category.

We find that marketing research bureau (MRB) respondents exhibit on average greater willingness to invest (Table IV Panels A and C), and lower risk perceptions (Table IV Panel A), but the effect of risk factor disclosure does not vary with the origin of the respondent. Similarly, the effect of regulatory certification (Table IV Panel A) does not vary with respondent origin, which suggests that the impact of either participation incentives, regulatory reputation, or familiarity with regulatory duties is limited.

Effective protection of investors also requires understanding the extent to which sensitivity to regulatory certification and disclosure varies with investor sophistication (Campbell *et al.*, 2011). Therefore, we interact the treatment variables with investor wealth, investor education, and primary market investment experience. Table V indicates that these characteristics do not alter our main results. However, the sample size in Table V Panel C decreases because information about investor primary market investment experience has been collected in a separate survey.

Sensitivity to regulatory certification and risk factor disclosure is not driven by regulatory awareness, participation incentives, and investor sophistication or investor experience. However, although factors such as overconfidence and financial literacy may affect the sensitivity to regulatory certification and risk factor disclosure, we lack suitable data to reliably test for these explanations.

4.4 Analysis of Prospectus Usage

Regulatory certification not only influences investors' intentions to invest, but can also increase the likelihood that investors consult the statutory prospectus due to increased awareness of its availability. Conversely, investors may decide to delegate trust to the regulator, rely on regulatory approval, and refrain from scrutinizing the prospectus themselves. We analyze this issue by asking our respondents to indicate how likely they would be to read the prospectus (Question 5 in the questionnaire).

Table VI reports that visually salient disclosure of risk factors (Model 4) and regulatory certification (Model 5) decreases the likelihood that investors will consult the prospectus. The interaction term in the final column indicates that simultaneous inclusion of these factors partially reverses the negative main effects. That regulatory certification has a negative impact on prospectus usage is consistent with the delegated trust explanation. However, the interaction term indicates that consultation regarding the prospectus is also explained by the risks disclosed in the advertisement. Consistent with Mayzlin and Shin (2011), advertising content influences subsequent search efforts for additional information. Note that the verbally salient risk factor disclosure (*Explicit Risk Disclosure*) has no effect on prospectus usage.

4.5 Within-Subject-Within-Offer Analysis

This section uses the within-subject-within-offer variation in our data set to estimate a difference-in-differences model. As indicated, the first and third advertisements encountered by our respondents are different versions presenting the same offering. Therefore, all the factors are constant except for the content of the advertisement and the experimentally induced learning effects. We measure variations in disclosure content by six indicator

Table IV. Regression analysis and interactions with respondent origin

This table contains the results for the OLS regressions. Panel A contains *Regulatory Certification* measured as a dummy that is equal to one if a salient reference to the regulator is included in the advertisement and zero otherwise. Panel B contains *Explicit Risk Disclosure* measured as a dummy that is equal to one if the risk description contains the word “risk” and zero otherwise. Panel C contains *Balanced Information* measured as a dummy that is equal to one if the risk factor disclosure is included in the salient section of the advertisement and zero otherwise. *Marketing Research B (MRB for short)* is a dummy variable that is equal to one if the respondent is part of the panel of the marketing research bureau and zero otherwise. The voluntary enrollment group serves as a reference category. The dependent variables are *Risk Perception* (Question 4) measured on a seven-point scale ranging from 1 “not risky at all” to 7 “very risky,” *Willingness-to-invest* (Question 1) measured on a seven-point scale ranging from 1 “certainly not investing” to 7 “certainly investing,” *Consult Other Information* (Question 2) measured on a seven-point scale ranging from 1 “certainly not consulting other information” to 7 “certainly consulting other information,” and *Amount Invested* (Question 3a) measured on a continuous scale ranging between 0 and 25,000 euros. The questionnaire can be found in the Appendix. First round responses are used and the control variables are listed in Table I. Robust *t*-statistics are reported in brackets. Significance is indicated by ***, **, and * at the 1%, 5%, and 10% levels, respectively.

	Risk perception	Willingness-to-invest	Amount invested	Consult other information
Panel A: Interaction analysis respondent origin × regulatory certification				
Regulatory certification	−0.243* [−1.87]	0.186 [1.45]	−257.8 [−0.22]	−0.039 [−0.16]
Origin(MRB) × Regulatory certification	−0.120 [−0.73]	0.057 [0.33]	1735.3 [1.29]	0.220 [0.72]
Marketing research bureau	−0.226* [−1.94]	0.360*** [2.93]	−1410.9 [−1.30]	−0.271 [−1.24]
Control variables	Yes	Yes	Yes	Yes
Number of obs	1125	1125	254	1125
R ²	0.07	0.07	0.13	0.08
F-statistic	24.07	2.90	1.66	3.34
Panel B: interaction analysis respondent origin × explicit risk disclosure				
Explicit risk disclosure	0.481** [2.38]	−0.280 [−1.51]	741.6 [0.36]	−0.727** [−2.10]
Origin(MRB) × Explicit risk disclosure	−0.395 [−1.63]	0.218 [0.89]	134.7 [0.06]	0.522 [1.20]
Marketing research bureau	−0.080 [−0.41]	0.263 [1.45]	−1245.7 [−1.16]	−0.559* [−1.84]
Control variables	Yes	Yes	Yes	Yes
Number of obs	562	562	121	562
R ²	0.11	0.10	0.26	0.11
F-statistic	2.68	2.43	1.52	2.57
Panel C: Interaction analysis respondent origin × balanced information				
Balanced information	0.067 [0.41]	−0.166 [−0.91]	1218.8 [0.71]	−0.649* [−1.84]

(continued)

Table IV. Continued

	Risk perception	Willingness- to-invest	Amount invested	Consult other information
Origin(MRB) × Balanced information	0.032 [0.14]	−0.018 [−0.07]	−443.8 [−0.22]	0.223 [0.50]
Marketing research bureau	−0.274 [−1.61]	0.412** [2.19]	1271.6 [0.92]	−0.131 [−0.41]
Control variables	Yes	Yes	Yes	Yes
Number of obs	563	563	133	563
R ²	0.08	0.11	0.24	0.11
F-statistic	13.69	2.33	1.71	2.53

dummies that capture differences between the first and third round advertisements.⁹ Our dependent variables are calculated by subtracting the third round responses from the first round responses, and (unreported) the descriptive statistics confirm that response behavior varies systematically with the treatment conditions.¹⁰ We add dummies for offering type and the advertisement encountered in the first and second rounds to control for the learning effects.

Table VII confirms that the presence or absence of regulatory certification significantly affects response behavior and dominates the effect of the risk factor disclosure. The addition (removal) of salient regulatory certification decreases (increases) risk perceptions by 6% (5.2%) and increases (decreases) the willingness to invest by 17.1% (8.1%). The other treatments are insignificant although their coefficients are in agreement with our hypotheses; consistent investors attach substantial weight to the presence or absence of regulatory certification.

4.6. Additional Robustness Analyses

In this section, we discuss the outcomes of several of the additional analyses we performed. First, by adding willingness to invest to the prospectus usage and information search model, we investigate whether investors lose interest in the offering if risks are saliently disclosed. If willingness to invest precedes the intention to search for information, then advertisements with salient risk disclosure yield a lower average willingness to invest in the presence of declining investor interest. Information search behavior is slightly lower for the groups who received salient risk disclosure (6.3 of 7) as compared to the reference group (6.5 of 7). The regressions in Tables A.III and A.IV of the Online Appendix indicate that willingness to invest has a positive effect on prospectus usage or searches for other information. Willingness to consult other information is lower for both risk treatments, but the positive interaction term indicates that the effects of risk disclosure are lower for investors who are more interested in the offering.

Next, we examine the sensitivity of our results to the specification of the regression model. We substitute the amount invested for the proportion invested from the hypothetical

9 Regulatory seal “on” indicates that the reference was lacking from the first round advertisement and is included in the third round advertisement, while “off” means it is excluded in the third round and included in the first round.

10 The results can be obtained from the authors.

Table V. Regulatory certification and investor characteristics

This table contains results for the OLS regressions. Panel A contains *Household Wealth > 150,000* measured as a dummy that is equal to one if the household’s financial wealth, excluding real estate, exceeds €150,000 and zero otherwise. Panel B contains *College/University Education* measured as a dummy that is equal to one if the respondent completed their education at the college or university level and zero otherwise. Panel C contains *Primary Market Investor* measured as a dummy variable that is equal to one if the respondent has prior experience with investing in the primary market and zero otherwise. *Regulatory Certification* is a dummy variable that is equal to one if a salient reference to the regulator is included in the advertisement and zero otherwise. The dependent variables are *Risk Perception* (Question 4) measured on a seven-point scale ranging from 1 “not risky at all” to 7 “very risky,” *Willingness-to-invest* (Question 1) measured on a seven-point scale ranging from 1 “certainly not investing” to 7 “certainly investing,” *Consult Other Information* (Question 2) measured on a seven-point scale ranging from 1 “certainly not consulting other information” to 7 “certainly consulting other information,” and *Amount Invested* (Question 3a) measured on a continuous scale ranging between €0 and 25,000. The questionnaire is contained in the Appendix. First round responses are used and the control variables are listed in Table I. Robust *t*-statistics are reported in brackets. Significance is indicated by ***, **, and * at the 1%, 5%, and 10% levels, respectively.

	Risk perception	Willingness-to-invest	Amount invested	Consult other information
Panel A: Interaction with household wealth				
Regulatory certification	−0.336*** [−3.96]	0.256*** [2.79]	1133.2* [1.86]	0.118 [0.76]
Household wealth > €150.000	0.084 [0.40]	0.023 [0.10]	−368.9 [−0.18]	0.085 [0.26]
Regulatory certification × Household wealth > €150.000	0.107 [0.42]	−0.260 [−0.85]	−1304.3 [−0.74]	−0.205 [−0.43]
Control variables	Yes	Yes	Yes	Yes
Number of obs	1125	1125	254	1125
R ²	0.07	0.06	0.12	0.08
F-statistic	19.50	2.29	1.63	3.27
Panel B: Interaction with education level				
Regulatory certification	−0.353*** [−2.71]	0.233 [1.61]	1114.2 [1.17]	−0.106 [−0.44]
College/university education	0.195 [1.20]	−0.091 [−0.53]	20.31 [0.01]	0.472 [1.51]
Regulatory certification × college/university education	0.051 [0.31]	−0.023 [−0.13]	−3.982 [−0.00]	0.310 [1.03]
Control variables	Yes	Yes	Yes	Yes
	Yes	Yes	Yes	Yes
Number of obs	1125	1125	254	1125
R ²	0.081	0.072	0.14	0.09
F-statistic	28.55	2.73	1.50	3.20

(continued)

Table V. Continued

	Risk perception	Willingness- to-invest	Amount invested	Consult other information
Panel C: Interaction with primary market investment experience				
Regulatory certification	-0.335*** [-3.30]	0.247** [2.30]	2113.3*** [2.75]	-0.112 [-0.60]
Primary market investor	0.057 [0.34]	0.554** [2.42]	202.6 [0.15]	0.154 [0.45]
Regulatory certification × primary market investor	-0.035 [-0.14]	-0.297 [-1.01]	-1577.6 [-0.87]	0.666 [1.57]
Control variables	Yes	Yes	Yes	Yes
Number of obs	845	845	186	845
R ²	0.08	0.09	0.21	0.10
F-statistic	37.16	2.53	2.62	5.81

€25,000 endowment and estimate Heckman regressions to account for response selection. Our results remain similar in these alternative specifications (see Table A.V in the [Online Appendix](#)).¹¹ Using ordered logit regressions for the ordinal variables, we again find similar results (see Table A.VI in the [Online Appendix](#)).

We also consider the possibility that respondents grasped the objectives of the experiment as they progressed through the questions. Moreover, respondents may have become less responsive due to fatigue. It is also conceivable that the lack of participation incentives had a more pronounced effect on our results as the study progressed. To assess the general impact of these explanations, we analyze the second- and third-round responses of the experiment. If respondents became either tired or aware of experimental objectives, then we would expect the treatment effects to diminish. Conversely, analysis time increases in explanatory power due to lower patience and interest. Finally, investors who failed to participate truthfully in the study may have caused inconsistent results across rounds or differences in distributions, which is reflected in the standard errors of the coefficients.

The analysis of the second and third rounds (Table A.VII of the [Online Appendix](#) and Table A.VIII of the [Online Appendix](#), respectively) responses indicates that the explanatory power of analysis time increases as the experiment progresses, as consistent with a fatigue effect. However, the regulatory certification effect remains strong and significant, and the regression coefficients and standard errors are similar across rounds. This latter finding mitigates our concerns that weak participation incentives lead to sabotaging answer behavior.

Finally, we assume throughout the study that respondents have not underreacted to our treatments due to the impression of being deliberately manipulated ([Campbell, 1995](#)). Feelings of deliberate manipulation were unlikely to affect first round responses as respondents had no reference material, while our second and third round effects indicate that our investors remained responsive to our treatments. Moreover, our treatments are sufficiently

11 We estimate a two-stage Heckman procedure, but lack data on a suitable instrument. Thus, our model is identified from the nonlinearity of the Mills ratio resulting in noisy and inflated first-stage standard errors ([Puhani, 2000](#)). As such, the Mills ratio might not adequately capture a selection effect and we are cautious in deriving definite conclusions from this analysis.

Table VI. Analysis of usage of the statutory prospectus

This table contains results for the OLS regressions. The dependent variable *Do you consider reading the prospectus* (Question 5) is measured on a seven-point scale ranging from 1 “certainly not considering reading the prospectus” to 7 “certainly considering reading the prospectus.” *Explicit Risk Disclosure* is a dummy that is equal to one if the risk description contains the word “risk” and zero otherwise. *Balanced Information* is a dummy that is equal to one if risk disclosure is included in the salient section of the advertisement and zero otherwise. *Regulatory Certification* is a dummy that is equal to one if a salient reference to the regulator is included in the advertisement and zero otherwise. The questionnaire is contained in the Appendix. Third round responses are used and the control variables are listed in Table II. Robust *t*-statistics are reported in brackets. Significance is indicated by ***, **, and * at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: Do you consider reading the prospectus?				
	(1)	(2)	(3)	(4)	(5)
Regulatory certification	−0.066 [−0.57]		0.092 [0.40]		−0.533** [−2.18]
Explicit risk disclosure		−0.082 [−0.49]	−0.099 [−0.41]		
Explicit disclosure × regulatory certification			0.035 [0.11]		
Balanced information				−0.395** [−2.31]	−0.725*** [−2.94]
Balanced information × regulatory certification					0.668**
Control variables	Yes	Yes	Yes	Yes	Yes
Number of obs	1125	562	562	563	563
R ²	0.04	0.08	0.08	0.06	0.07
F-statistic	6.44	1.89	1.80	3.22	3.40

well-specified, given that responses to the open questions reveal respondents having recognized changes in risk disclosure.

5. Discussion

In this section, we discuss the policy, welfare, external validity, and generalizability of our results. As noted in the introduction, the expectation that rational investors should not react to the presence of regulatory oversight is arguable. Even if all offerings disclosed the presence of regulatory oversight equally, the informative value of regulatory certification may still obtain. This emerges as a function of the market structure, which is composed of both exempted and a nonexempted securities offering. As an example, suppose that an investor can choose from an exempted and nonexempted offering. The presence of regulatory approval provides limited information for nonexempted offerings because the regulatory requirements are homogeneous for these deals. However, if investors compare non-exempted against exempted offerings, then disclosing the presence of supervision may provide valuable signals about the quality of the information provided, risk of fraud or even to

Table VII. Difference-in-differences analysis

This table contains the results for the OLS regressions. The dependent variable is the difference measured as $\text{response}_{\text{first round}} - \text{response}_{\text{third round}}$ of *Risk Perception* (Question 4), *Willingness-to-invest* (Question 1), and *Consult Information* (Question 2). The explanatory variables are dummy variables that are equal to one if the treatment was included (on) or excluded (off) in the third round as compared with the first round and zero otherwise. The questionnaire is can be found in the Appendix. The type of advertisement and the second round treatment are included as control variables. Robust *t*-statistics are reported in brackets. Significance is indicated by ***, **, and * at the 1%, 5%, and 10% levels, respectively.

	$\Delta(\text{Risk perception})$	$\Delta(\text{Willingness-to-invest})$	$\Delta(\text{Consult information})$
Regulatory seal “on”	−0.329*** [−4.05]	0.385*** [4.83]	−0.012 [−0.10]
Regulatory seal “off”	0.284*** [3.42]	−0.183** [−2.15]	−0.135 [−1.03]
Explicit risk disclosure “on”	0.118 [1.02]	−0.144 [−1.23]	−0.047 [−0.31]
Explicit risk disclosure “off”	−0.077 [−0.69]	−0.098 [−0.85]	0.055 [0.32]
Balanced information “on”	0.091 [0.82]	−0.142 [−1.28]	−0.255 [−1.60]
Balanced information “off”	−0.015 [−0.13]	0.002 [0.02]	−0.140 [−0.90]
Control variables	Yes	Yes	Yes
Number of obs	1,125	1,125	1,125
R ²	0.06	0.07	0.01
F-statistic	2.60	2.82	1.20

a limited extent on economic fundamentals. Moreover, nonexempted offerings are heterogeneous on dimensions such as the type of offering and the issuer. Nonexempted offerings that resemble exempted offerings, for example due to the size or type of issuer, may benefit more from regulatory approval compared to nonexempted securities offerings by well-known (blue-chip) companies that have lower asymmetric information. Despite the exclusion of these conditions from our experimental setup, we cannot completely rule out that past experiences with exempted offerings may drive subjects’ responses.

This consideration raises the question: Would regulating references to regulatory oversight or standardizing this disclosure eliminate any welfare losses as compared to the current situation? Although the discriminatory value of regulatory oversight may be reduced by regulating disclosure or removing exemptions to the prospectus regime, these types of interventions may introduce new inefficiencies to the market. This may be the case if regulatory approval acts as a decision heuristic for investors. Regulating the disclosure of regulatory oversight may perceptually give nonexempted offerings an advantage over exempted offerings. If issuers of exempted offerings want to raise capital at attractive terms, then they may want to restructure their offering to become nonexempted. This can be achieved by increasing the offer size to exceed €2.5 million as this threshold requires the publication of

an approved prospectus. If offering sizes become driven by regulatory requirements rather than by economic opportunities, then a suboptimal allocation of capital may result in new welfare losses. Similarly, the removal of exemptions to the prospectus regime would eliminate the discriminatory value of approval, albeit at the disadvantage of introducing new supervision costs and increasing the barriers to access in the capital market. Finally, investors can be educated to increase their understanding of financial market supervision; however, such initiatives are costly and may have only limited effects (Fernandes, Lynch, and Netemeyer, 2014). Hence, no obvious policy interventions exist that would yield improvements upon the current situation without potentially introducing new inefficiencies. Therefore, the further regulation of advertising content, especially on risk disclosure, may be a starting point in providing more balanced information to investors (Shaton, 2017).

Next, we discuss the external validity of our findings. The simplified decision environment and survey-experimental approach that we use to collect data may lead to an over- or underestimating of the effects and the precision and validity of our results. The validity of survey experiments is partly driven by the use of a representative sample and the random assignment to treatment groups (Barabas and Jerit, 2010) and both conditions are fulfilled in our research design. In their examination of returns disclosure, 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, and we therefore developed treatments closely aligned with actual offerings. Moreover, our results show that minor variations in information saliency and wording of (risk factor) disclosure affect the response behavior of participants, which is consistent with our hypotheses and studies based on field data (Beshears *et al.*, 2017) or field experiments (Bertrand *et al.*, 2010). Several studies also indicate that survey experiments (e.g., vignette studies) provide valid results for the prediction of actual risky decision behavior (East, 1993; Weber and Milliman, 1997; Hainmueller, Hangartner, and Yamamoto, 2015).

Finally, it should be noted that regulatory certification may be referred to in multiple information channels (e.g., brochures and investor meetings). As such, investors may encounter the same stimulus multiple times, thereby reinforcing its effects, while the complexity of the actual information environment may dilute its stand-alone value. Therefore, we posit a value in future research for analyzing the interaction between multiple sources of information to provide additional insights into the incremental effects of regulatory certification on investor behavior. The risks created by regulatory certification are not merely hypothetical, as evidenced by the fact that European financial regulators took action to reduce unjustified references to regulatory oversight in marketing materials. This development confirms our findings entailing actual behavior by capital raising firms, but also points toward the generalizability of our findings outside the Dutch capital markets. Admittedly, regulatory certification effects are most likely to be found in those offerings directly targeted toward individual investors because no other trust-enhancing activities by intermediaries or wealth managers are performed. The absence of external scrutiny of these offerings raises the risk that investors are manipulated by offerors who include framed information on regulatory prospectus approval. Moreover, an extensive body of research shows the impact of external reviews on economic behavior (Zhu and Zhang, 2010). It is therefore likely that the effects documented in this article are generalizable to other (regulated) markets where third-party review is present.

6. Conclusions

Certification by trusted third parties such as bankers, auditors, and selling shareholders can assist investors in assessing the quality and motives for security offerings in conditions of asymmetric information. We examine whether a similar effect obtains through salient references in advertisements to regulatory approval of the prospectus, referred to as “regulatory certification.” Financial market supervision is widespread, but its effects on investor behavior are insufficiently understood. Despite being essentially only informative about compliance with basic disclosure requirements, prospectus approval can, for example, be construed as an approval of the offering itself. Limited knowledge about regulatory duties combined with an overload of information increase investors’ vulnerability to these certification effects. We observe that in contrast to regulatory certification, fundamental information, for example on risk factors, is often disclosed with low visual and verbal saliency. This factor may decrease the attention that investors spend on these attributes despite their importance for investment decision making.

Using a survey experiment, we find that the addition of salient references to regulatory oversight in advertisements decreases the perceived riskiness of the offering and increases the willingness to invest by as much as 17%. Experienced investors appear to delegate trust to the regulator and spend less effort searching for additional information when salient regulatory certification is present. Sensitivity to regulatory certification is not affected by investor experience or investor sophistication and regulatory certification does not increase prospectus usage. Risk factors that are verbally and visually saliently disclosed contribute to higher risk perceptions and decrease the intention to search for additional information.

Our findings contribute to the literature on certification signals in securities offerings (Booth and Smith, 1986; Megginson and Weiss, 1991) and deepen our understanding of the side effects of regulation. If unsophisticated investors misinterpret the meaning of regulatory certification, then issuers can use this observation to successfully market their securities to investors, especially if other trust-enhancing channels are absent. Further research is needed to understand how these effects emerge given heterogeneous securities offerings. An analysis of this type may shed light on the effectiveness of policies to counteract the externalities of regulation without creating new side effects. Since financial market regulation is developed as a function of the market structure, significant research may result from exploiting the homogeneity in European capital market regulations and the heterogeneity in supervisory approaches across European countries. This setup can provide valuable insights on the emergence of regulatory externalities as a function of supervision practices, heterogeneity in market structure, and historical developments across countries.

Supplementary Material

[Supplementary data](#) are available at *Review of Finance* online.

Appendix

Questionnaire

After each advertisement in the experiment:

Question 1 (*Willingness to invest*):

Would you consider purchasing bonds from this fund?

Answer: 7-point scale: 1 certainly not investing—7 certainly investing.

Question 2 (Consult other information):

Would you consult other sources of information before you consider investing in this bond?
 Answer: 7-point scale: 1 certainly not consulting other information—7 certainly consulting other information.

Question 3a (Amount invested) (if response to question 2 > 3):

Suppose that you have 25,000 euros available for investment purposes. How much would you be willing to invest in this proposition?
 Answer: amount ranging from 0 euros to 25,000 euros.

Question 3b (Reason not investing) (if response to question 2 ≤ 3):

Why would you not consider investing in the proposition?
 Answer: open.

Question 4 (Risk perception):

How risky do you consider this proposition?
 Answer: 7-point scale: 1 not risky at all—7 very risky.
 Exit question (after all advertisements have been shown)

Question 5 (Consider reading the prospectus):

Would you consider reading the prospectuses after watching these advertisements?
 Answer: 7-point scale: 1 certainly not—7 certainly.

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