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**Knowing is trusting? An
experimental test of the role of
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Knowing is trusting?

An experimental test of the role of information in advisory

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Abstract. The recent economic crisis still lingering in Europe has deeply affected the way individuals look at the investment market. Understanding the trust processes underlying the decision to invest with financial intermediaries is of particular importance both at managerial (product development and advertisement) and at normative level (how intermediaries are regulated). Using an online experiment, this paper investigates whether discrepancies in the financial literacy of investors and brokers can be used to explain the decision to trust – thus, to invest in the financial market. The results show that trust is affected by the information disclosure in somewhat unexpected ways.

Keywords: financial market, financial literacy, trust, advisory.

JEL Classification Numbers: D12, D8, D91, G11

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1. Introduction

The corporate scandals broken out in all major economies since 2000 (e.g. WorldCom, Enron, Parmalat, Bear Sterns, up to Lehman Brothers and AIG) and the economic crisis still lingering in Europe have deeply affected the level of trust of individuals, both expert and non-expert, in financial markets and financial advisors. Understanding the trust processes underlying the decision to participate in financial markets is very important both at managerial and at normative level. From the managerial point of view, understanding the factors that influence the investment process and the choice of particular kinds of financial products is of great importance for financial institutions, both for the design and for the advertisement and distribution of the products themselves. From the normative point of view, it is important to investigate the mechanisms guiding individuals' saving behaviour in order to regulate the markets, which needs to be reorganized according to the public opinion.

This research aims at enriching the literature about trust in financial markets, focusing on a specific aspect of the process of market participation: the role played by financial advisors.

There are at least two streams of research investigating financial advisory: the first one focuses on investors' characteristics and how they can influence the search for advisory (Bernheim, 1998; Lusardi e Mitchell, 2006; van Rooij et al., 2011); the second one looks at the role played by advisors in influencing investors' participation in the financial market (Collins, 2010; Inderst, Ottaviani, 2009). This research belongs to the first stream of literature and investigates trust between investors and advisors through an experimental analysis. In particular, we address two main research questions: the first one aims at verifying if the financial literacy of advisors affects the level of trust they receive; the second one looks at how trust changes when we have/have not information about the advisor, independently on his/her level of financial literacy. Answering these two questions can help shed further light on the current debate regarding the trustworthiness of financial markets and may have significant policy implications.

2. Literature review

Several studies in economics and finance have tried to determine why stock market participation is so scant (Haliassos and Bertaut, 1995; Guiso et al., 2001). Information and transaction costs are listed among the major reasons why individuals fail to invest their money and

savings (Vissing-Jorgensen, 2004). In fact, the investment process is time consuming: investors must collect a huge amount of information regarding companies, institutions and countries whose securities they want to buy. Moreover, they incur costs for the trading activity (buying, selling securities) and for the advisory, in case they decide to entrust the management of their money to a financial professional.

More recently, academics have tried to motivate the inadequate stock market participation focusing on more intrinsic reasons: the tendency to underinvest could derive from an overall financial illiteracy (Lusardi et al., 2011), i.e. from individuals not being sufficiently familiar with the basics of economics and finance. Nationwide surveys showed that in US (Lusardi e Mitchell, 2007), Netherlands (Van Rooij et. Al., 2011) and other European countries (Christelis et al., 2010) only one third of individuals are able to answer correctly three simple questions regarding basic economic principles, like the compounding of interests, the role of inflation on the purchasing power and the different riskiness of financial securities (liquidity, stocks, bonds). Moreover, the financial illiteracy influences the quality of financial decisions. In fact, less literate individuals do not plan for retirement (Van Rooij et al., 2001; Lusardi e Mitchell, 2008), do not invest in the financial market (Van Rooij et. Al., 2011), diversify less their investment portfolios (Guiso e Jappelli, 2009), save less (Bayer et al., 2009; Cole e Shastry, 2009), use more debt (Lusardi e Tufano, 2009) and, consequently, are less rich (Lusardi e Mitchell, 2007).

Other studies reveal that, income and wealth being equal, there are differences in the stock market participation based also on geographical factors (Guiso et al., 2004). For example, the stock market participation of low-income families in Sweden, Denmark and Switzerland is more than double than in Austria, Spain and Italy. Guiso et al. (2004) also show that Italian families tend to invest more in the regions where blood donation rates are higher, the electoral participation is greater and people trust more their neighbours. Thus, other factors affecting the stock market participation are trust (Gambetta, 1998) and sociability: a high level of trust, together with the network a person belongs to, impact on the willingness to invest in the financial market (Guiso et al., 2008, Georgarakos, Pasini, 2011). On the contrary, the lack of trust and the fear of being cheated deter households from investing.

Judging from this literature, financial literacy and trust seem to play a fundamental role in determining individual investment behaviour. Thus, recent studies tried to analyze the effect of these variables on the stock market participation, also focusing on the role that advisory can play in helping individuals to efficiently allocate their money. Collins (2010) suggests financial advisory

as a possible solution of the financial illiteracy problem. However, the delegation process underlying advisory and financial intermediation is not straightforward and is characterised by some critical features: first, investors could face a counterpart that does not make their interests, thus increasing their mistrust; second, the advisors/brokers are subject to a conflict of interests, being themselves the representatives of the seller, whose products they are offering to investors (Inderst, Ottaviani, 2009). Even if the advisors were subject to a conflict of interests, they could be incentivized to suggest a buy rather than a sell because the former generates higher commissions or because an optimist broker can have better relations with the company, whose securities he/she is selling (Krausz and Paroush, 2002). For all these reasons, trust is the fundamental prerequisite in order to make the money transfer from the investor to the advisor possible. Recent studies showed that the lack of trust in the financial system and in the financial intermediaries reduces the probability of investing in the stock market. Guiso et al. (2008) find that those who trust their neighbour more are more willing to buy stocks and, once they decide to participate in the stock market, they buy a higher number of securities. Likewise, Pasini and Georgarakos (2009) find a positive relation between trust in financial institutions and stock market participation in several countries. The reason lies in the fact that, when the investor is afraid of being cheated, the expected return of the investment decreases but, if it is not high enough, the investor will prefer to stay out of the market. Trust in financial institutions has a direct impact also on the participation in the US 401(k) retirement saving plans.

Besides trust, another relevant issue when deciding to rely on financial advisory concerns the financial skills of the advisor and the investor. It is proven that more literate individuals choose “better” consultancy, i.e. they prefer professionals to relatives or friends (Bernheim, 1998; Lusardi e Mitchell, 2006; van Rooij et al., 2007). Moreover they will have an easier access to the stock market, given that literate investors are more able to understand financial instruments. Van Rooij et al. (2007) highlight that in the Netherlands financial literacy is associated with higher stock market participation. However, the relation between financial literacy and the search for advisory is not obvious. On one side, one would expect that the less literate an investor is, the higher his/her quest for advisory is. However, it is proven that this relation is positive only when the investor: a) is less overconfident (Kruger e Dunning, 1999); b) has a higher opportunity cost of time (Hacketal et al., 2012); c) sees advisory as a complementary source of information (Calcagno e Monticone, 2011); d) believes that advisors provide the best investment advise (Bucher-Koenen e Koenen, 2011); e) is less impatient (Frederick, 2005). Instead, the relation is negative when more

literate individuals are more aware of the conflict of interests between advisors and clients (Hackethal, Inderst e Meyer, 2011), when they do not see the need of being assisted by a professional as they are able to process all information by themselves, having better skills and being part of the best social networks (Korniotis e Kumar, 2013), or when they are less risk averse (Frederick, 2005).

The studies that try to put together trust, financial literacy and advisory are still few and their results are somewhat contradictory. In this respect, one of the first contributions belongs to Monticone (2010), who demonstrates that a high level of trust in the advisor together with good financial skills increases the probability to hold risky assets. Moreover, the same study highlights that trusting the financial advisor increases the propensity to follow his/her recommendation. On the contrary, the financial literacy helps investors to avoid non-professional sources of advisory but, at the same time, reduces the probability to look for an advisor, being the investor able to invest autonomously. Studying the relation between financial literacy and search for advisory, Calcagno and Monticone (2011) find that less literate investors either invest more independently or delegate the whole management of their portfolio. Instead, Kramer (2012) finds that the perceived level of financial expertise is negatively correlated with the search for financial advisory, while the measured financial literacy and the cognitive abilities are not correlated with the search for advisory. This result shows that advisory is not a sufficient condition to fully offset financial illiteracy. The author discovers that individuals with a lower schooling level and a lower risk attitude tend to rely less on financial advisors, whereas older and richer individuals tend to trust advisors more and to use all their services.

This research tries to shed light on this debate and offers an original contribution: by using an experimental approach, we investigate the relation between trust towards an advisor and financial literacy (of both parts) in the investment process.

3. An experiment on trust and financial literacy

I. The Trust game

The framework chosen to assess the impact of perceived financial literacy on trust between a client and his broker is the classic *Trust game* (Berg, 1995). This game involves two participants: the first one (the Investor) is endowed with a sum of money (z) he may invest in full or in part (x)

with a second participant, knowing he may also decide to keep the entire sum to himself and not invest anything. If he decides to invest something ($x > 0$), the money invested gets tripled by the experimenters, in order to simulate the effects of a real investment. The tripled sum ($3x$) is then transferred to a second participant (the Trustee), who may then independently decide how much (y), if any, to return to the first participant. The structure of the game is common knowledge across participants.

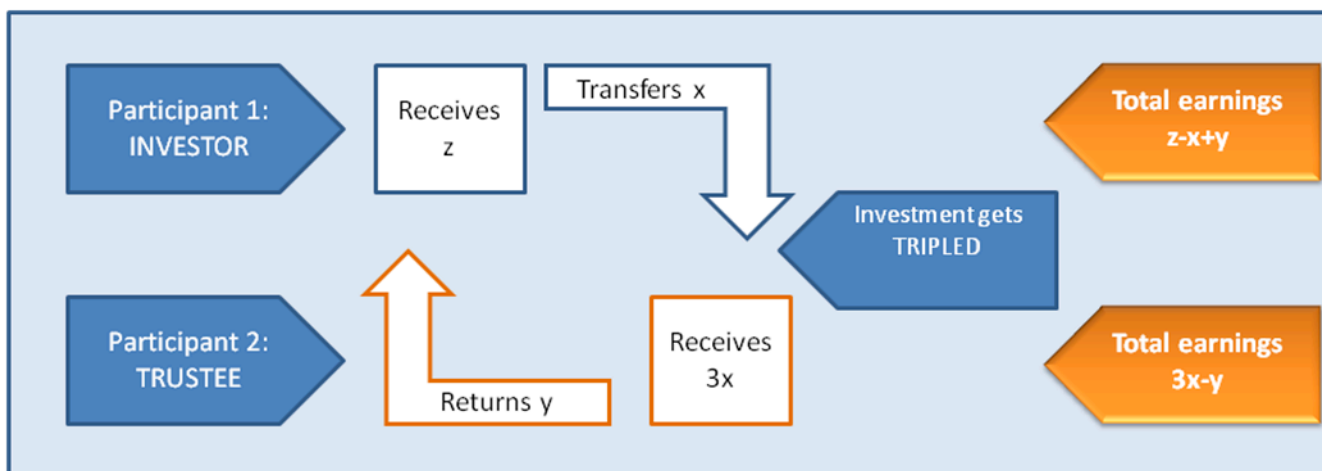


Figure 1: Structure of the Trust Game (own elaboration)

Total earnings for the Investor amount to the sum between the share of the initial sum that has not been invested ($z - x$) and how much is returned by the Trustee (y); total earnings for the Trustee are the difference between the tripled investment by the Investor ($3x$) and how much he/she returns (y). In general, the sum transferred from the Investor to the Trustee (x) is used to measure trust, while the amount returned by the Trustee to the Investor is used to measure trustworthiness.

The trust game allows capturing important features of the trust process with a very simple structure; in particular, the game structure allows for a straightforward theoretical equilibrium that serves as a useful benchmark to classify observed behavior. In particular, using backward induction, the theoretical equilibrium prescribes that no money is ever invested with the second participant, as the Investor correctly anticipates that no money will ever be returned, as both are assumed to act as selfish profit maximizers.

The Trust game has been replicated both in the laboratory and in field experiments showing that a very minor share of participants actually fulfills the game-theoretic predictions, making no

investments or returning nothing (Johnson, Mislin, 2011)¹: the average transfer is, in general, above zero.

The economic literature has used the Trust Game to address the reasons inducing an individual (an investor) to trust another (a consultant or financial intermediary) with his money, identifying two main drivers of trust: anticipated reciprocation (how much one expects will be returned) and adherence to a social norm of trusting (professionals are to be trusted because of their role). For instance Bicchieri (2011) finds how trust does not depend on a social norm, but is a measure of anticipated reciprocation, with social norms more salient in deciding how much to return. On the other hand, Cox (2004) finds that both drivers apply in context of one-shot anonymous interactions, showing how the literature is not yet unanimous on what ultimately determines trust.

Economics, sociology and psychology have addressed the determinants of trust and continue to do so in light of the important implications of trust on social and economic transactions we face every day: from choosing which clauses to include in a contract, to employer-employee relationships, trust reduces transaction costs.

In a context of increasing uncertainty regarding financial markets, addressing which are the determinants of trust in professionals becomes a viable avenue to support market participation and protect clients and agents both now and in the future, making this research relevant for financial institutions and policy makers.

II. The experiment

The data used in this article were collected during a public event organized by Ca' Foscari University of Venice called Research Night (RN) held on September 27, 2013 and through the social network Facebook (FB) between March 14 and March 22, 2014. Overall 159 valid questionnaires have been collected from voluntary participants, who remained anonymous and have not received any economic incentive². The experiment was run in Italian.

¹ Johnson e Mislin (2011) compare 162 different trust game experiments showing how in all cases the average transfer is above zero, despite a large variability in average transfers across studies.

² The participants have not received any monetary compensation for their participation.

Given that the goal of this research is to identify the reasons supporting trust in financial intermediaries, all participants in the study have been assigned the role of investors – the participant who decides how much to transfer of his endowment to a trustee³.

The experiment is hypothetical in that participants were informed before making their choices that their actions would not translate into a monetary gain, differently from what normally happens in a classic economic experiment⁴.

The experiment is based on a questionnaire⁵ presented in web format to the participants using three laptop computers during the Research Night and by distributing the link through Facebook.

The questionnaire is made up of three parts, presented to all participants in the same order:

1. Financial literacy (questions borrowed from Lusardi [2007]);
2. Trust game;
3. Socio-demographic information.

Part 1 (*Financial literacy*) includes 5 multiple-answer questions aimed at addressing the knowledge of some basic finance concepts such as compound interest or inflation. Each question offers 4 possible answers, the last of which is “I do not know” in all questions.

After completing all five questions, the software returns the number of correct answers provided.

The second part is structured as a classic trust game aimed at addressing how perceived literacy affects trust. The game is introduced by a short description in which all the rules of the game are clearly stated. The experiment is structured along three different treatments, differing in the information provided regarding the financial literacy of the player who will receive their transfer. In the baseline treatment, no information is provided regarding financial literacy, while the other (information) treatments inform the participants they are playing with a trustee that is more (or less) literate than they are.

It is important to remember that all participants undergo the financial literacy section right before the trust game, receiving a feedback on their actual performance. Moreover, participants in the information treatments receive instructions that clearly state that the only information regarding

³ In the experiment, the trustee is simply referred to as a second player. This second player is a fictitious one, in the sense that the choices of the participants were not matched with real choices from other participants called in to fill the role of trustees. This choice is coherent with the fact that the entire experiment is hypothetical. To provide a more enjoyable experience to the participants, some fictitious trustee responses were created and the software randomly assigned them to players. This simply allowed them to walk away with a full perception of the game, but it did not affect the structure of the game, as participants knew for the start that no monetary payment will be offered to them for their participation.

⁴ In a classic economic experiments, total earnings will be computed following Figure 1, mirroring real choices made during the experiment.

⁵ Available upon request.

the second player they are about to receive is whether he is more or less literate than they are, where literacy has been assessed through the same questionnaire they just completed. This information is reinforced by stating precisely in the instructions of the information treatments that “the other player scored higher (lower) than you in the financial quiz”.

Before receiving the feedback on how much is returned (through the random mechanisms) all participants have to complete the third section of the questionnaire, regarding socio-demographic information such as:

- Age, income, gender, profession and education;
- Risk aversion and financial experience.

Once this last section is completed the software presents the (random) feedback on the returned investment and with final remarks and thank you.

III. Results

A. Sample description

Our sample is composed by 159 subjects, 86 interviewed during the “Research Night” (RN) and 73 through the Facebook (FB) campaign (Table 1).

	RN	FB	Total
Male	41	40	81
Female	45	33	78
Total	86	73	159

Table 1: Participants

Before analyzing the data, we tested the possibility to use together the two samples. In fact, although we used the same questionnaire in the two samples, it is necessary to verify if the physical presence of the interviewer, even if not intrusive, and the different context (collective during the Research Night and individual in the Facebook session) had different effects in the two cases. The statistical analysis confirmed that financial decisions taken in the cases RN and FB were

not statistically different, thus the two samples can be analyzed together (Wilcoxon's test, p-value=0.94⁶).

Figure 2 summarizes demographic characteristics of the entire sample involved in our experiment.

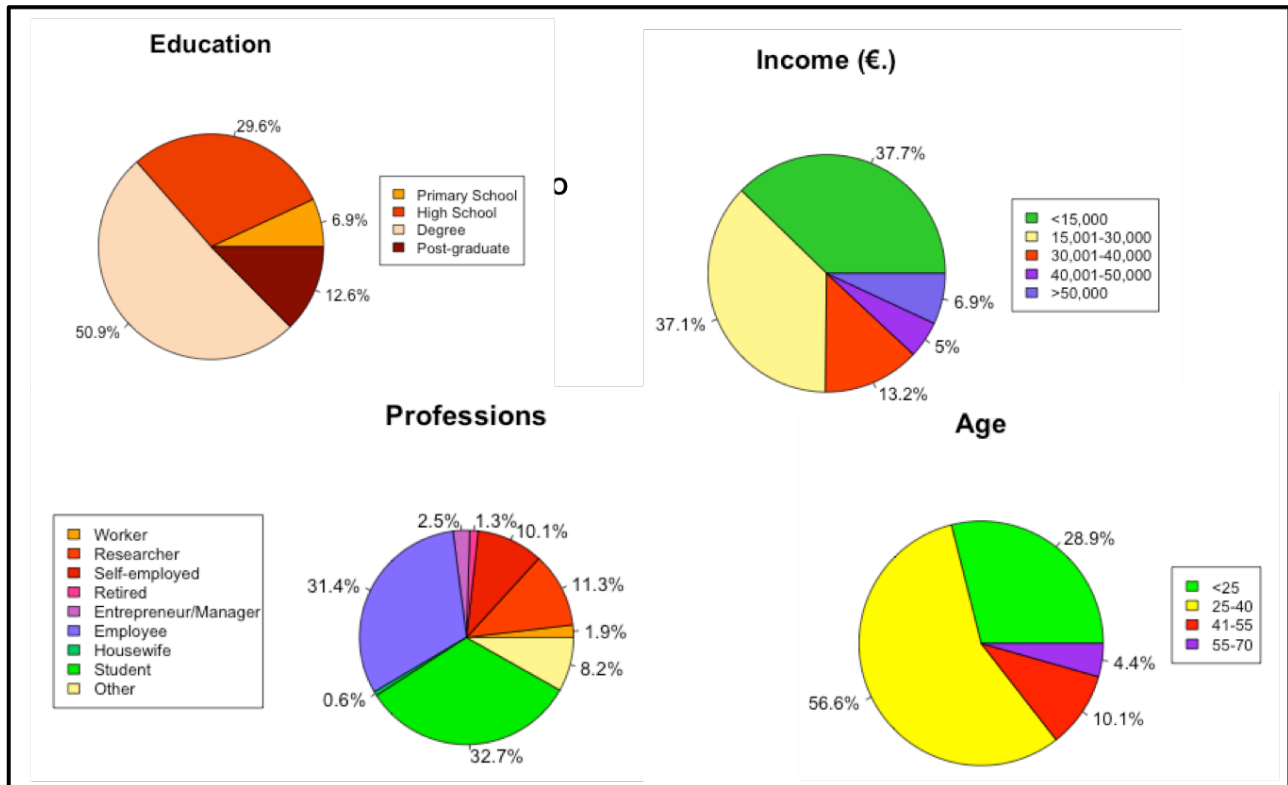


Figure 2 – Demographic characteristics of the sample

As Figure 2 shows, participants were young (about 80% of the sample is younger than 40 years old), highly educated (about 80% has a Master or Doctoral degree), with low-income level (about 80% earns less than 30.000€. per year). However, students are only about one third of the total sample (33%).

B. Trust: transferring and hypotheses testing

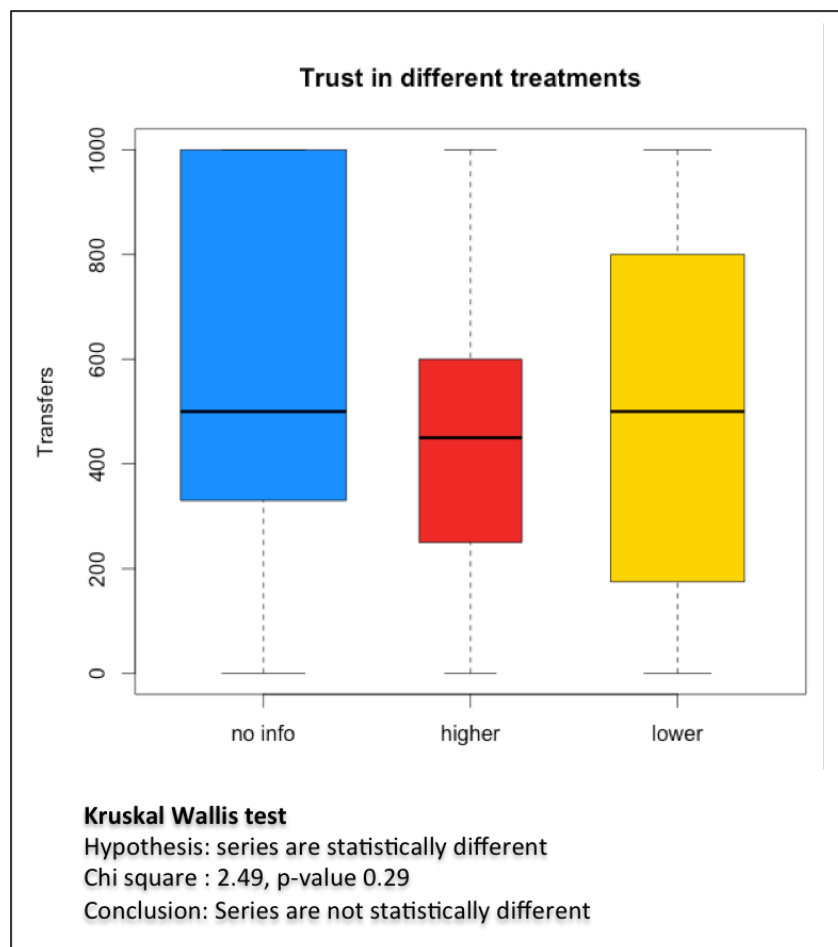
One of the goals of this experiment is to understand whether having information about the financial literacy of intermediaries influences the trust level of investors. In order to answer to this

⁶ Wilcoxon's test (Wilcoxon, 1945) is a non parametric test which aims at identifying if two data series can come from the same distribution. The test hypothesis is that two data series are statistically different, and it is rejected when the p-value is above the 0.10 threshold. When the hypothesis is rejected it can be concluded that the two data series can be treated as if they come from the same distribution. The use of non parametric tests is frequent in experimental research since the limited number of observations and data characteristics often affect hypotheses' validity of the more common parametric tests.

research question, the experiment includes three different treatments and, to avoid contamination between them, each individuals participated in only one treatment:

- 78 persons were involved in the “no info” treatment, where no information about intermediary’s financial literacy was provided;
- 30 persons participated in the treatment where the intermediary had a higher financial literacy level (“info_sup”);
- 51 persons participated in the treatment where the intermediary was described as having a lower financial literacy level (“info_inf”).

Figure 3 shows the investments distributions (money transferred to intermediaries) in the three treatments. The comparison among the three (Kruskal Wallis test⁷) does not show any significant differences, but this can be partially due to sample numerosity. Thus, it cannot be concluded with sufficient statistical certainty whether different types of information have an impact on the trust level between investors and intermediaries or not.



⁷Kruskal Wallis test is a non-parametric test which allows to verify whether three (or more) data series are statistically different (Kruskal e Wallis, 1952).

Figure 3: Comparison among investments distributions of the three treatments and Kruskal Wallis test.

On the contrary, a significant statistical difference can be observed in the investor-intermediary transfers comparing the case in which some information about intermediary’s financial literacy level is given (“info”, merging the “info_sup” and “info_inf” treatments) and the case where no information is provided (Figure 4). Wilcoxon test supports the hypothesis that in case of no information, investments are significantly higher with respect to the other case (p-value=0.08⁸). Thus, the hypothesis that having information about the intermediary’s financial literacy affects the trust level of investors is supported.

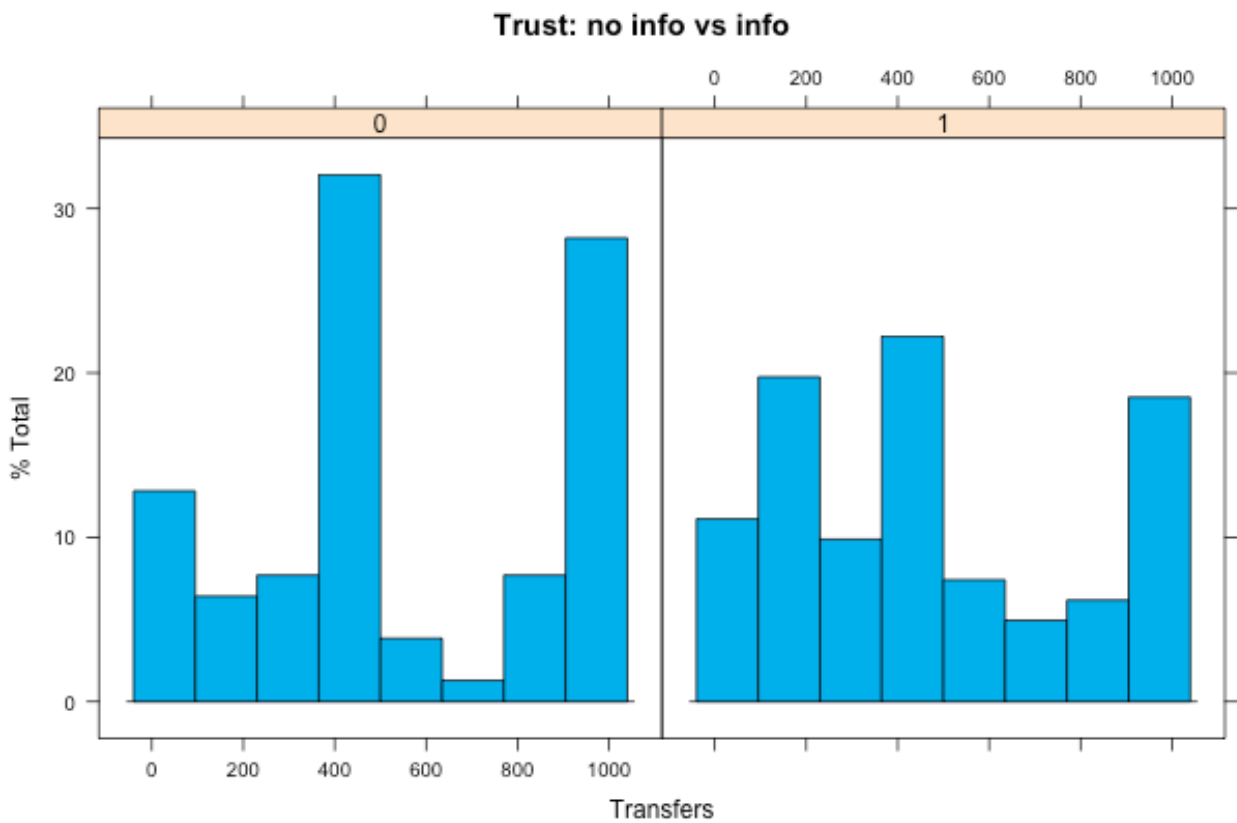


Figure 4: Comparison between investments of no info and info treatments.

In order to explore possible motivations behind the trust level of investors towards intermediaries we also looked at the effect of other variables (besides financial literacy) where the literature does

⁸ A p-value lower than 0.10 supports the hypothesis that the two data series are statistically different.

not offer conclusive results. An interesting result emerges from the analysis of the relationships between investments and investors' risk propensities. Recall that a specific section of the questionnaire was dedicated to identify three investors' risk profiles: (1) risk averse, (2) risk neutral, (3) risk lover.

These results show how different risk propensities lead to different trust choices, not only from a descriptive point of view, but also at statistical level (Kruskal Wallis test sustains the hypothesis that different risk profiles result in investments significantly different with a p-value=0.04).

In order to further investigate the relationship between risk propensity and trust we run a logit regression. Our dependent variable is Trust, measured through a binary variable distinguishing investments above (Trust=1) and below (Trust= 0) a defined threshold (identified with the median of all transfers, equal to 500). The model takes the form:

$$p(x) \equiv P(y=1 | x) = G(x\beta)$$

where $x\beta = \beta_1 + \beta_2x_2 + \dots + \beta_kx_k$, and $G(z)$ is the cumulative probability function which links $x\beta$ to the answer probability (Wooldridge, 2001). In the logit model, where $G(z)$ is the logistic function, the effect of x_j on the probability of making an investment above the median, is given by the sign of β_j .

Our main independent variable is the *Risk Propensity*, to which we added two control variables as suggested by the literature. Our model can be formalized as follows:

$$\text{Trust} = \text{Education} + \text{Income} + \text{Risk propensity} + \xi$$

Results of the logit regression are summarized in Table 2.

	Coefficients	Std. Error	p-value
Intercept	-2,3272	0,8655	0,0072**
Education	0,3222	0,2274	0,1566
Income	0,3218	0,1633	0,0487*
Risk propensity	0,9621	0,3632	0,0081**

Significance: '***' 0.001, '**' 0.01, '*' 0.05, '' 1
 Null deviance: 213.52 on 158 degrees of freedom
 Residual deviance: 199.00 on 155 degrees of freedom
 AIC:207

Table 2: Logit Regression.

The logit analysis confirms the statistical significance of the relationship between risk propensity and trust, showing a positive correlation between the two variables. The interpretation of this result is that risk lovers and risk neutral individuals make significantly higher transfers with respect to risk-averse investors, showing a higher propensity to trust intermediaries.

Moreover, the analysis shows that there are no differences between investors with different levels of education, showing a statistically insignificant coefficient. On the contrary, the control variable Income is an explicative variable of investors' trust towards intermediaries. The positive coefficient confirms that investors with higher levels of income will show higher levels of trust towards intermediaries.

4. Discussion and conclusions

The main aim of this research was to investigate, through an experimental analysis, two main hypotheses: (1) whether investors show higher levels of trust towards intermediaries with a higher level of financial literacy with respect to their own or not; (2) whether having information about the intermediary's financial literacy affects investors' trust, independently from their own level of financial literacy.

The literature review showed how trust is an issue of particular relevance in the field of financial investments, even if it is not very easy to draw normative conclusions. The results presented in this paper support only hypothesis (2), namely that having information about intermediaries influences trust levels of investors; on the contrary, hypothesis (1) is not supported by our data. However, results supporting hypothesis (2) are somehow surprising, since they show that investors' trust is negatively affected by information about intermediaries. Respondents informed of the intermediaries' financial literacy level, in fact, made lower investments, showing lower levels of trust - differently from what expected.

This result can be interpreted looking at the investment process: giving information about intermediaries' financial literacy levels seems to make investors focus on the evaluation of their counterpart, making a comparison between their own ability and the ability of the other player.

On the contrary, participants playing with no information, seem to follow a social norm, trusting the counterpart only on the basis of personal attitudes.

Experimental results seem to suggest that if the goal were increasing investors' participation in the financial market, financial organizations would not have any benefit in introducing a certification system on their own intermediaries' professionalism, since it could produce negative results on investors' participation decisions.

On the other side, if the trust process is mediated mostly by social norms, it seems important to understand in which ways to present intermediaries and which financial information can stimulate trust development.

Increasing participation in financial markets remains a relevant theme, and the results presented in this paper suggest the necessity to develop further empirical investigations on the delegation process of financial decisions to intermediaries on behalf of investors. In particular, an interesting path to further develop this research would be to explore the role of financial literacy of investors and intermediaries both on trust and interaction process between the two counterparts. Even if the present work offers several suggestions, we acknowledge also some limitations: the experiment is based on a hypothetical questionnaire, and the limited data numerosity inhibited the opportunity to investigate other relationships between variables. To further develop the present work, a laboratory experiment could be developed, introducing also monetary incentives for participation and efforts, linking rewards to the choices made during the game.

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