



Contents lists available at ScienceDirect

## Journal of Banking and Finance

journal homepage: [www.elsevier.com/locate/jbf](http://www.elsevier.com/locate/jbf)Delegated investment decisions and rankings<sup>☆</sup>Michael Kirchler<sup>a,b,\*</sup>, Florian Lindner<sup>c</sup>, Utz Weitzel<sup>d,e</sup><sup>a</sup> University of Innsbruck, Department of Banking and Finance, Universitätsstrasse 15, 6020 Innsbruck, Austria<sup>b</sup> University of Gothenburg, Department of Economics, Centre for Finance, Vasagatan 1, Gothenburg 40530, Sweden<sup>c</sup> Max Planck Institute for Research on Collective Goods, Kurt-Schumacher-Str. 10, Bonn 53113, Germany<sup>d</sup> Vrije Universiteit Amsterdam, De Boelelaan 1105, Amsterdam, 1081HV, the Netherlands<sup>e</sup> Radboud University, IMR, Heyendaalseweg 141, Nijmegen 6525AJ, the Netherlands

## ARTICLE INFO

## Article history:

Received 16 September 2019

Accepted 3 September 2020

Available online 16 September 2020

## JEL classification:

G02

G11

D03

C93

## Keywords:

Experimental finance

Social competition

Rankings

Financial professionals

Delegated decision making

## ABSTRACT

Two aspects of social context are central to the finance industry. First, financial professionals usually make investment decisions on behalf of third parties. Second, social competition, in the form of performance rankings, is pervasive. Therefore, we investigate professionals' risk taking behavior under social competition when investing for others. We run online and lab-in-the-field experiments with 805 financial professionals and show that professionals increase their risk taking for others when they lag behind. Additional survey evidence from 1349 respondents reveals that professionals' preferences for high rankings are significantly stronger than those of the general population.

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There is a long-standing debate whether and how payment schemes with bonus or tournament components drive excessive

risk taking in developed financial markets (Jensen and Meckling, 1976; Rajan, 2006; Diamond and Rajan, 2009; Bebchuk and Spammann, 2010; Kleinlercher et al., 2014). However, it is not just these incentives' monetary aspect that influence risk taking. It can also be fueled by a second component: non-monetary social competition or rank incentives that promise utility to those at the top of the ranking and disutility to those at the bottom (Barankay, 2015).<sup>1</sup> Recently, Kirchler et al. (2018) have shown that finance professionals care for high rank in investment decisions among peers. The authors report that the display of a non-incentivized ranking triggers increased risk taking among underperformers when they take investment decisions on behalf of themselves.<sup>2</sup> However, while

<sup>☆</sup> We thank Christoph Engel, Sascha Füllbrunn, Simeon Schudy, Matthias Stefan, Matthias Sutter, and Erik Wengström, all seminar participants at the Universities of Graz, Innsbruck and Nijmegen and the Max Planck Institute for Research on Collective Goods, and conference participants at the BEAM-ABEE Workshop 2018 in Amsterdam; Decision Making for Others 2018 at Radboud University; Experimental Finance 2018 in Heidelberg; and the Innsbruck Winter School on Credence Goods, Incentives, and Behavior 2018 for their valuable comments on earlier versions of this paper. We are grateful to Achiel Fenneman, Dirk-Jan Janssen, Patricia Leitner, Fritz Pöllmann, Lorenz Titzler, Alexander Wolf, and Jan Zatočil for their excellent research assistance. We particularly thank Rani Piputri and all the participating financial institutions and professionals for their excellent collaboration and enthusiasm. We gratefully acknowledge the financial support from the Austrian Science Fund (FWF START-grant Y617-G11, SFB F63), Radboud University, and the Swedish Research Council (grant 2015-01713). This study was ethically approved by the Institutional Review Board (IRB) of the University of Innsbruck; all subjects participating in this experiment signed letters of consent. Declarations of interest: none. The experimental software, do-files and data files can be retrieved from the OSF repository <https://osf.io/6fjg7/>. A prior version of this paper was circulated with the title "Delegated Decision Making and Social Competition in the Finance Industry."

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<sup>1</sup> There is a growing experimental literature documenting that rank incentives, on average, increase individuals' effort and performance in labor markets and educational settings (Azmat and Iriberry, 2010; Blanes-i-Vidal and Nossol, 2011; Tran and Zeckhauser, 2012; Bandiera et al., 2013; Delfgaauw et al., 2013; Gill et al., 2018); although rank incentives can also promote unethical behavior (Charness et al., 2014). See also Veblen (1899) and Festinger (1954) for two classic papers and Roussanov (2010) for one application in finance.

<sup>2</sup> The authors also show that the rank effect is robust to the experimental frame (investment frame versus abstract frame), to the underlying incentives (non-incentivized ranking versus tournament incentives), to social identity priming

professionals in the study of Kirchler et al. (2018) invest solely for themselves, a major part of finance professionals take decisions on behalf of third parties—for example in the role of financial adviser and investment manager (Gennaioli et al., 2015; Andersson et al., 2016).<sup>3</sup>

Recent empirical studies highlight the relevance of investigating professionals' behavior when taking decisions for customers. Foerster et al. (2017) and Linnainmaa et al. (2019) show that financial advisers typically invest personally just as they advise their clients. This indicates that advisers' individual preferences and attitudes play a crucial role for the final composition of customers' portfolios. Empirical studies also highlight the relevance of rank preferences for professionals. Brown et al. (1996) and Elton et al. (2003) report that fund managers are influenced by peer performance, as mid-year losers increase fund volatility compared to mid-year winners. Taken together, this suggests that not only mutual fund customers but also other clients are vulnerable to professionals' rank preferences when they invest on behalf of others. Causal inference is difficult, however, as both rank incentives and monetary incentives play a role in delegated decision making simultaneously.

In experiments, causal inference in situations of delegated decision making is more straightforward. Several experimental studies with students and general population samples report a "risky shift", indicating that decision makers take more risks or show less loss-averse behavior for others than for themselves (e.g., Sutter, 2009; Chakravarty et al., 2011; Andersson et al., 2016). A substantial number of studies also find a "cautious shift", showing that decision makers take less risk when the money of third parties is invested (e.g., Bolton and Ockenfels, 2010; Eriksen and Kvaloy, 2010). Although these experiments offer first causal evidence on determinants in delegated decision making, they lack external validity for the world of financial professionals, because of subject pools that are limited to students and samples of the general population. Moreover, these studies are mute on the role of rankings in delegated decision making.

Taken together, it is surprising that no causal evidence exists whether professionals' rank-driven behavior affects their investment decisions on behalf of customers. Following the literature outlined above, the answer is far from clear. On the one hand, professionals may be very competitive and care a lot about rankings, due to, for example, career concerns. Consequently, they may increase risk taking when lagging behind, as shown in Kirchler et al. (2018), no matter whether they invest on behalf of themselves or on behalf of others. On the other hand, professionals may feel responsible for customers and/or have strong social preferences. Here they may suppress their competitiveness and social status concerns, in line with evidence on the "cautious shift", and thus react less strongly to rankings when they invest on behalf of others compared to investments for themselves.

In this paper we therefore investigate experimentally the impact of rank incentives on financial professionals' risk taking behavior when they take investment decisions for third parties. Our study builds on the online experiment in Kirchler et al. (2018) and extends it with treatments focusing on professionals who invest for real clients. The main result and contribution is that, when investing for clients, professionals' reveal a rank-driven behavior that is

not very different from their rank-driven behavior when they invest for themselves.

Specifically, we conducted an online experiment with 805 financial professionals from the United States, and an offline experiment as a robustness check with 160 professionals (outlined in the online appendix). In addition, we administered an online survey to 1349 respondents from the general population, the finance industry, and other competitive professions in order to identify differences in competitive attitudes. We recruited financial professionals who are directly or indirectly involved in investment decisions for others or in the planning and advice of decisions by others. This includes, for example, fund managers as well as financial advisors, but also analysts or risk managers. Some participants may be more directly involved in investment decisions that affect others, either by taking the decisions for others (fund manager) or by advising others (financial advisor and planner), others may affect decisions for third parties more indirectly, by, for example, influencing the decision of an advisor or fund manager (e.g., an analyst). Throughout the paper we refer to all participants from the financial industry as "professionals". We would like to emphasize that we have to differentiate between the role a professional has in the experiment and the role the participants have as their job description. As indicated above, in real life participants may differ in the degree with which they are involved in investment decisions that affect others. In the experiment, however, all professionals take on the role of an investment manager, who directly invests money of and for third parties. By exposing a broader set of professionals to a clearly defined and controlled investment task we are able to analyze fundamental behavioral aspects of professionals deciding on behalf of third parties without restricting our study to a very narrow subfield of the finance industry.

In our main experiment the baseline investment task was a modified version of Kuziemko et al. (2014), which was first used as online experiment in Kirchler et al. (2018). We extended this task with treatments focusing on professionals investing for real clients. In the baseline treatment, the computer randomly assigned each professional a rank in the distribution of initial wealth in US dollars {54.0, 49.5, 45.0, 40.5, 36.0, 31.5} in a group of six. Subsequently, professionals had to choose between a risk-free alternative and a risky asset for themselves. The ranking itself was not relevant for the monetary payout. In three additional treatments, we kept everything identical to the baseline, except that we let professionals invest for customers, which we recruited separately. The customers used their own money to participate in the experiment. The payoff of the customers depended solely on professionals' investment decisions and performance. This also applied to the downside, which the clients agreed to cover personally, in written consent, should the allocated professional incur losses. With this novel experimental construction we set up three treatments, (i) we varied the visibility of the customer (Bordalo et al., 2013) during the investment task (low versus high customer salience), and (ii) we varied professionals' monetary incentives (either incentives that are linear/aligned with the customers' incentives or flat/non-aligned incentives).

We show that rankings drive professionals' behavior on behalf of their customers. In particular, we find that professionals who are lagging in the ranking increase their risk taking in comparison to their peers. Importantly, we show that this rank-driven behavior is not different from professionals' behavior when they are investing for themselves (with the same, linear incentive structure). Even when customers are made more salient, the rank-driven behavior of professionals remains intact. This finding is remarkable, because in our setting the participant with the worst rank should

(private identity versus professional identity), and to professionals' gender (no gender differences among professionals).

<sup>3</sup> In 2017, for example, over 215,000 professionals were employed in the financial advice industry in the US, indicating the importance and prominence of delegated decision making, both on behalf of and together with others (<https://www.ibisworld.com/industry-trends/market-research-reports/finance-insurance/securities-commodity-contracts-other-financial-investments-related-activities/financial-planning-advice.html>).

be the least likely to increase risk.<sup>4</sup> Moreover, we find some tentative evidence that rank-driven behavior when investing for others gets weaker when professionals are exposed to flat and hence non-aligned incentives. We also report that professionals' perceptions of customers' risk attitudes do not influence their investment behavior. Professionals' behavior is mainly driven by their own risk attitudes and their level of loss aversion when making decisions for others.

Our results complement the findings from Kirchler et al. (2018) by showing that rank-driven risk taking behavior of financial professionals extends to investment decisions on behalf of others. This finding raises the question to what extent professionals differ in their rank-driven behavior from other groups, such as their customers. If customers are equally rank-driven, it is possible that they enjoy monetary and non-monetary benefits from the fact that their chosen private banker or financial advisor tries to outperform his or her peers. Therefore, in a final, exploratory step, we investigated whether professionals differ in their preferences for relative performance and competition from a representative sample of the general population (as a proxy for a wide variety of bank customers) and from other competitive professions. Specifically, we administered an online survey to another sample of 125 financial professionals, a representative sample of 1000 respondents from the general population, as well as 120 professional athletes and 104 academics (1349 respondents in total). The results show that financial professionals stand out in the survey, as their self-reported preference for relative performance is more pronounced compared to the general population and to academics, coming close to the high level of professional athletes. Financial professionals also differ from the general population in other aspects, for example, in higher status concerns and risk attitudes.

Our paper contributes to two emerging areas in the literature. First, we contribute to the expanding literature on delegated decision making for third parties in financial frameworks. Similar to Foerster et al. (2017) and Linnainmaa et al. (2019) we find that professionals investing on behalf of third parties, invest personally just as they do for their clients. As mentioned earlier, the experimental studies exploring drivers of risk taking in delegated investment decisions with student or general population samples offer a wide range of approaches and show rather mixed results, indicating both a risky and a cautious shift.<sup>5</sup> Our work contributes to this field with three innovations: (i) we study financial professionals in their role of investment managers, who (ii) invest real money from clients, and who (iii) are exposed to competition for rank. Finally, Kirchler et al. (2018), who mainly focus on investment decisions for oneself, also administered one side treatment (with only 48 subjects) where professionals invested jointly for themselves and for a family member (endowed with windfall money). The authors find a marginally significant rank effect. Our paper provides a much deeper analysis by recruiting third parties that are real clients (instead of family members), who invest their own money (instead of windfall money), under different regimes of professionals' incentives (linear vs flat), and with different levels of third party salience (low vs high).

Second, we contribute to the small but growing corpus analyzing the behavior of financial professionals. Across studies, one major result is that professionals' behavior can substantially differ

from standard (student) subjects' and representative general population samples'. For instance, compared to student subjects, professionals exhibit a higher degree of myopic loss aversion (Haigh and List, 2005), are less prone to anchoring (Kaustia et al., 2008), can better discern the quality of public signals in information cascades (Alevy et al., 2007), and are responsible for less frequent and less severe bubbles in lab asset markets (Weitzel et al., 2020). However, professionals apparently also show herd behavior similar to student subjects' (Cipriani and Guarino, 2009), are similarly prone to framing effects in investment decisions (Schwaiger et al., 2020), and apply behavior in line with prospect theory (Abdellaoui et al., 2013). We contribute by learning more about the behavior of professionals as agents for their customers, which is central to modern economies.

## 1. Experiment OPM – professionals investing for clients

### 1.1. Setup of the experiment OPM

In this online experiment, we divided each session into two parts. Subjects played an investment game in the first and major part and participated in additional tasks and survey questions eliciting loss aversion, attitudes towards risk, and personal characteristics in the second part.

For the first part of the experiment—the investment game—we designed a modified version of Kuziemko et al. (2014). Our baseline treatment OWN was identical to Treatment TRANK<sup>FIN</sup> of the online experiment in Kirchler et al. (2018).<sup>6</sup> Below, we outline details on Treatment OWN first and add differences in the three treatments, in which professionals invest real third parties' money.

In each group of six, the computer randomly assigned each player a rank in the distribution of initial wealth in US dollars {54.0, 49.5, 45.0, 40.5, 36.0, 31.5}. The ranking itself was not relevant for the payout. All of this was common knowledge. Professionals decided between two alternatives: they either selected \$2.25 euros with 100% probability or a lottery paying out \$9 with 75% probability or \$-18 with 25% probability. After each period, all random draws were independently and separately drawn for each player, and the league table with the final wealth of this period was displayed. The final wealth was computed by adding \$2.25 to the initial wealth, in case the safe option was chosen, and by either adding \$9 or subtracting \$18 if the lottery was chosen. For the next period, the professionals were randomly selected into another group of six and re-randomized to the same {54.0, ..., 31.5} distribution of initial wealth levels. Each online session consisted of three independent periods. The final wealth of one randomly selected period (including the loss aversion task, which ran as additional control task after the investment experiment) was paid out with 20% probability. One important feature of this design was that the safe payment always equaled half the difference between ranks (\$2.25) and, therefore, ceteris paribus, did not improve one's position. The positive lottery outcome equaled the difference of two ranks above the decision maker (\$9), and the negative lottery outcome, the difference of four ranks below her (\$-18). Note that the final wealth was always above zero and that both alternatives (safe and lottery) had the same expected value, assuming risk neutrality. According to the literature, participants in the lab have been shown to exhibit diminishing absolute risk aversion, and risk taking is believed to increase with initial wealth levels (see, among others, Levy, 1994; Holt and Laury, 2002). This means that, purely based on wealth levels, the player with the worst rank (rank 6)

<sup>4</sup> Participants in the lab usually exhibit diminishing absolute risk aversion and risk taking increases at initial wealth levels (see, among others, Levy, 1994; Holt and Laury, 2002). Hence, our design takes a conservative position, because the observed rank-driven behavior works against a possible increase of risk taking in wealth (Kuziemko et al., 2014).

<sup>5</sup> See Füllbrunn and Luhann (2015) and Eriksen et al. (2017) for excellent overviews of the designs, results, and implications of associated studies.

<sup>6</sup> We recruited 51 additional professionals from the same professional subject pool for Treatment OWN ( $N = 202$  in total). Importantly, there was only little time delay of a few weeks between both recruitment waves.

would be the least likely to choose the lottery (Kuziemko et al., 2014). Hence, our design adopted a conservative position, because rank-driven behavior would have to work against a possible increase of risk taking in wealth.

In all treatments of Experiment OPM, we first made subjects' professional identity salient before the investment task, according to the protocol of Cohn et al. (2014, 2017) and Kirchler et al. (2018).<sup>7</sup> Second, we let them play against other professionals and displayed depersonalized information on their job function, years of experience in the finance industry, and what professionals considered the most important personality characteristic for an employee in the finance industry. This information was extracted from the initial priming questions and displayed alongside each subject's rank and initial (final) wealth on the decision (results) screen, thereby making the professional identity of the other players in the group salient.<sup>8</sup>

Treatment SAL\_LO (salience low) was identical to the baseline treatment, except that professionals invested for real customers with linear (and thus aligned) incentives and low customer salience on the computer interface. In all treatments with customers, we raised real funds from third parties amounting to the distribution of initial wealth in US dollars {54.0, 49.5, 45.0, 40.5, 36.0, 31.5}. In each period, professionals decided whether to invest their clients' portfolio wealth either in the risky lottery or to take the fixed payment. Importantly, professionals' incentives were aligned so they received the same payout as their customers (although their initial level of wealth was a windfall gain, which diverged from customers' incentives, as they brought money in). With this design choice, we aimed to approximate professionals' real-world decision making. In our design, professionals knew that negative returns because of their investment decisions represented real monetary losses for customers.

We recruited customers with the following characteristics: male, 30–50 years of age, academic degree, and no financial troubles. All customers received instructions for the experiment and signed a declaration of consent. This information was given to the professionals as well. We did not forward any other customer information to the professionals to allow sufficiently large freedom of choice among the professionals. The salience of the assigned customer was low, meaning that we mentioned the customer in the general instructions in two paragraphs, but only once at the beginning of the experiment and without any reminders on subsequent decision screens. Compared to the baseline treatment, we added the following information: *"Your decisions in the following rounds also affect the payout of a client, whom we randomly assigned to you and who will receive a payout according to your decisions. The client is not part of the group of the five other experimental participants with whom you will play the game on the next screens, but another person whom we approached separately. The client is a male, between 30 and 50 years old, holds a university degree, is in no financial trouble, and knows the rules of this game. (That is, the client has read the instructions and agreed to them by signing a declaration of consent). The client does not receive the initial wealth from us, but*

*pays it out of his own pocket. At the end of all the rounds, we will randomly draw one round and then pay the client his new wealth (the initial wealth plus the outcome of your choice). At the end of this experiment, you can indicate whether you want to receive depersonalized information about the amount earned by everyone in this research project (including the clients)."* This information was displayed on a separate page to increase awareness about the existence of the customer, and professionals had to click a button to proceed. With this treatment, we could investigate whether making investment decisions for third parties changed investment behavior compared to making decisions for oneself like in Treatment OWN.<sup>9</sup>

Treatment SAL\_HI (salience high) was identical to Treatment SAL\_LO, except that we increased customer salience by adding the following reminder above the decision entry field on the decision screen: *"Keep in mind that your decision below also affects the payoff of the client, whom we matched with you. The client does not receive the initial wealth of \$54 from us, but pays it out of his own pocket."*<sup>10</sup> This strategy allowed us to identify whether increasing customers' salience (Bordalo et al., 2013) substantially moderated rank-driven behavior compared to Treatment SAL\_LO. Following this line of the literature, decision makers could potentially weight more heavily certain decision attributes that influenced their behavior in favor of these salient attributes. According to this logic, professionals' behavior could be less focused on relative performance and competition with an explicit level of customers' salience.

Finally, Treatment FLAT was identical to Treatment SAL\_HI, except that incentives were no longer linear and aligned with the customers' performance. Here, professionals received a fixed payment of \$45 from the experiment, irrespective of performance. With this treatment, we tested whether flat and non-aligned incentives moderated rank-driven behavior (Eriksen and Kvaloy, 2010; Andersson et al., 2013; 2016). Table A.1 in the online appendix outlines the details of all the treatments used in this paper.

In the second part of the experiment, we ran additional tasks and asked our survey questions. We measured risk attitudes (on a Likert scale from 1 to 7) with two survey questions from the German Socio-Economic Panel (SOEP) inquiring about subjects' general willingness to take risks and their willingness to take risks in financial matters (SOEP; Dohmen et al., 2011). Professionals answered the questions: (1) *"How do you see yourself: Are you willing to take risks or try to avoid risks?"* (2) *"People can behave differently in different situations. How would you rate your willingness to take risks in the following areas: ... in financial matters?"* The answers were provided on a Likert scale from 1 (not at all willing to take risks) to 7 (very willing to take risks). In addition, we measured professionals' perceived risk attitudes of third parties on a 7-point Likert scale by slightly adapting the first SOEP question from above. In particular, we asked the following question: *"How do you see the client: Is he generally a person who is fully prepared to take risks or does he try to avoid taking risks? (The client is a male, between 30 and 50 years old, holds a university degree, and is in no financial trouble)."* In the second task, we measured loss aversion using the procedure of Gächter et al. (2007), which was also applied in Kirchler et al. (2018).<sup>11</sup>

<sup>7</sup> We asked the following seven priming questions in each treatment: "At which financial institution are you presently employed?"; "What is your function at this financial institution?"; "For how many years have you been working in the financial sector? (Please enter full years; can be in different organizations and/or functions)"; "Why did you decide to become an employee in the financial sector? Please describe your answer in two to three sentences."; "What are, in your opinion, the three major advantages of your occupation as an employee in the financial sector?"; "Which three characteristics of your personality do you think are typical for an employee in the financial sector?"; "What are the three most important things you learned in your occupation as an employee in the financial sector?";

<sup>8</sup> Like Cohn et al. (2014), we collected data on the other players in a pilot group ex ante and imported the data into both treatments. Only the characteristics of the pilot group were shown to others (anonymized) after their explicit consent.

<sup>9</sup> See the online Appendix A.3 and A.6 for instructions regarding all the experiments of this paper.

<sup>10</sup> \$54 are mentioned for illustrative purposes. Of course, the five other initial endowments were mentioned conditional on the initial rank.

<sup>11</sup> Subjects earned \$18 for participating in the experiment, which covered their potential maximum loss in the loss aversion task. In particular, professionals had to decide whether to play the lottery. If they decided to play the lottery, participants either received, with equal probability, \$15 or incurred a loss of X, which varied from \$3 to \$18 in increments of \$3. If participants decided not to play a specific lottery, they received a payout of zero. At the end of the experiment, one lottery

In addition, we administered a survey and measured participants' attitudes toward social comparison with three questions on social status, financial success, and relative performance, taken from Cohn et al. (2014, 2017). Moreover, we added the five-item competition subscale of the Work and Family Orientation (WOFO) questionnaire of Helmreich and Spence (1978) to measure professionals' willingness to compete.<sup>12</sup> Questions on demographics concluded the experiment.

For Experiment OPM, we recruited 805 professionals from the US in collaboration with an internationally operating market research agency. In particular, we only recruited professionals who regularly engage directly or indirectly in investment decisions in their professional life.<sup>13</sup> Out of the entire sample, 45.5% were men, and the average age was 41.9 years, with 12.8 years of working experience in the finance industry. We consciously recruited a similar number of male and female professionals to potentially address questions about gender differences among financial professionals. Moreover, we randomly allocated subjects into treatments, thereby ensuring randomization of gender and job functions across treatments.<sup>14</sup>

In total, professionals received an average payout of \$12.50 for both parts of Experiment OPM for an average duration of 10 min, which is equal to an average hourly salary of \$75.<sup>15</sup> For those professionals who were paid out, the average payout was \$62.90, ensuring salient incentives for professionals. Therefore, we considered our monetary incentives to be substantial and were confident that they induced sincere behavior. Customers allocated, in total, \$25,789.50 to 604 professionals, who invested the funds across all OPM treatments (i.e., excluding the baseline treatment OWN where professionals invested for themselves). After the experiment, customers received \$27,121.50. Hence, professionals generated a total dollar return of \$1,332 for all customers, which amounted to an average dollar return of \$41.63 per customer (minimum \$–36 and maximum \$126).<sup>16</sup> The payout was administered via PayPal to the professionals and via bank transfer to the customers. Moreover, all professionals received an anonymous summary of all payouts to the clients by e-mail after all data for this experiment was collected. This was announced ex ante and it was done for transparency reasons. As we recruited customers that were never directly in touch with their agents, we considered this an important

and its associated decisions were paid out with 20% probability with the payout of the investment experiment.

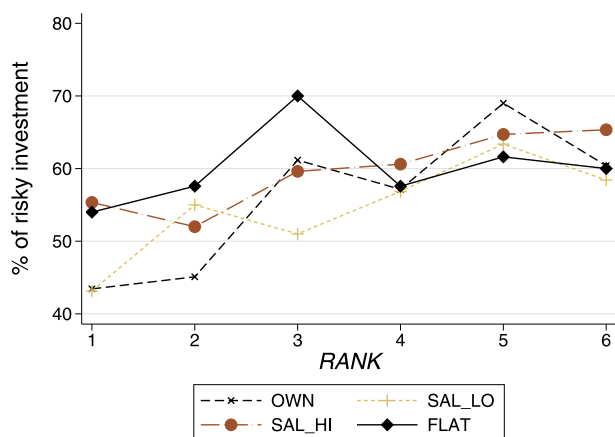
<sup>12</sup> The five questions, answered on 5-point Likert scales, were: "I enjoy working in situations involving competition with others"; "It is important to me to perform better than others on a task"; "I feel that winning is important in both work and games"; "It annoys me when other people perform better than I do"; and "I try harder when I'm in competition with other people."

<sup>13</sup> Only professionals who worked in at least one of the following positions in real life were allowed to participate in our experiment: asset liability management, acquisitions, client advisor, fund management, fund placement, investment advisor, investment banking, portfolio management, private equity/banking, risk management, sales, trading/brokerage, treasury, wealth management, customer support, compliance, relationship manager.

<sup>14</sup> Randomization checks (available on request) confirm this.

<sup>15</sup> This is comparable to other studies with financial professionals. For instance, Haigh and List (2005) reported in footnote 6 that their average traders' payment for a 25-minute task was \$40, which translated to an hourly payout of \$96.

<sup>16</sup> We allowed customers to allocate money to more than one professional. In particular, each customer could select between 1 and 20 randomly allocated professionals to invest for him/her independently by simply indicating the number on the declaration of consent and by providing the associated amount to invest. In total, we recruited 32 customers according to the above mentioned characteristics and they selected, on average, 18.87 professionals to invest for them (604 professionals in total). This was done for two reasons: first, like in reality customers can spread their money also across different professionals (for instance, customers select different mutual funds and/or split their wealth across different wealth managers without professionals' knowledge (e.g., pensions funds, private investment advisers, etc.)); second, operationally it was easier to recruit a sufficient number of customers by allowing them to invest more money.



**Fig. 1.** Ranks and Risk Taking across Treatments in Experiment. OPM. This figure shows the fraction of choices for investments in the risk lottery (*RISK*) conditional on professionals' rank at the beginning of a period, separated by treatments. *RANK* indicates the position in a ranking at the beginning of a period, with higher numbers pointing at lower initial wealth levels. In Treatment OWN, professionals invest for themselves and face linear incentives. In treatments SAL\_LO and SAL\_HI, professionals invest for real customers with linear (aligned) incentives and low or high customer salience, respectively. In Treatment FLAT, customer salience is also high, but professionals earn a fixed payment.

issue in further improving the credibility of our study among the participating professionals.

### 1.2. Results of experiment OPM

In Fig. 1, we present a first overview of professionals' choices for the risk lottery as a function of initial rank across treatments. In Table 1, we show probit estimations of professionals' likelihood to invest in the lottery (*RISK*) conditional on rank. In addition to variable *UNDERPERFORM*, indicating professionals at below-average ranks 4 to 6, and variable *RANK*, showing subject *i*'s rank according to initial wealth, we include controls for professionals' self-assessed risk attitudes in financial matters (*RISKFIN*), professionals' beliefs about customers' willingness to take risks (*RISKCUST*), professionals' loss attitudes (*LOSSTOL*: normalized from 0 to 1; higher values indicate lower loss aversion and thus higher loss tolerance), *AGE*, gender (*FEMALE*), and professionals' willingness to enter competitions and to compete (*COMPETE*, measured with the five-item competition subscale of the Work and Family Orientation (WOFO) questionnaire). Moreover, the interaction terms (e.g., *RANK*\**SAL\_LO*) measure treatment differences in the rank-effect w.r.t. variable *RANK* (column ALL). Here, OWN serves as the reference category for the rank-effect and is captured with variable *RANK*.

We find clear and significant evidence for rank-driven behavior when professionals invest for themselves. In particular, variables *UNDERPERFORM* and *RANK* are significantly positive at the 1% level in Treatment OWN (columns (1) and (5)).<sup>17</sup> This is in line with the results in Kirchler et al. (2018), demonstrating that underperforming professionals increase their risk taking markedly compared to their high-ranked peers. Once professionals invest for customers and still face linear incentives in treatments SAL\_LO and SAL\_HI, rank-driven behavior remains relatively strong as underperformers also increase their risk taking significantly compared to high-ranked peers (columns (2), (6) and (3), (7), respectively). Note that, in SAL\_HI, both the effect size and the statistical significance of the coefficients *UNDERPERFORM* and *RANK* are slightly weaker than in

<sup>17</sup> Throughout the paper we do not report statistically significant results at the 10% level to reduce the likelihood of false positive results.

**Table 1**

Ranks and Risk Taking in Experiment. OPM. This table shows probit regressions of professionals choosing the risky lottery (*RISK*), conditional on rank. *UNDERPERFORM* is a binary dummy variable marking professionals at below-average ranks 4 to 6. *RANK* indicates subject *i*'s rank at the beginning of a period according to initial wealth. *RISKFIN* is the self-reported willingness to take risks in financial matters (7-point Likert scale; taken from the GSOEP), *RISKCUST* is professionals' belief about the customer's willingness to take risks (7-point Likert scale; adapted from the GSOEP), and *LOSSTOL* measures loss attitudes (from 0 to 1: higher values indicate lower loss aversion and, thus, higher loss tolerance). *COMPETE* is the five-item competition subscale of the Work and Family Orientation (WOFO) questionnaire and *AGE* and *FEMALE* indicate professionals' age and gender, respectively. In Treatment OWN, professionals invested for themselves and faced linear incentives. In treatments SAL\_LO and SAL\_HI, professionals invested money of customers with linear (aligned) incentives and low or high customer salience, respectively. In Treatment FLAT, customer salience was high, but professionals received a fixed payment. The interaction terms (e.g., *RANK*\*SAL\_LO) measure treatment differences in the rank-effect w.r.t. *RANK* (column ALL). Here, OWN serves as the reference category and is captured with *RANK*. Clustered standard errors on a subject level are given in parentheses. \*\* and \* represent significance at the 1% and 5% levels, respectively.

<i>RISK</i>	(1) OWN	(2) SAL_LO	(3) SAL_HI	(4) FLAT	(5) OWN	(6) SAL_LO	(7) SAL_HI	(8) FLAT	(9) OWN	(10) SAL_LO	(11) SAL_HI	(12) FLAT	(13) ALL
<i>UNDERPERFORM</i>	0.311** (0.101)	0.250* (0.100)	0.204* (0.103)	-0.021 (0.098)									
<i>RANK</i>					0.111** (0.028)	0.078** (0.030)	0.066* (0.029)	0.022 (0.028)	0.114** (0.029)	0.077** (0.030)	0.067* (0.029)	0.025 (0.029)	0.113** (0.028)
<i>RISKFIN</i>									0.157** (0.046)	0.086 (0.045)	0.068 (0.048)	0.146** (0.052)	0.111** (0.023)
<i>RISKCUST</i>										0.004 (0.046)	-0.046 (0.052)	0.044 (0.053)	
<i>LOSSTOL</i>									0.061 (0.230)	0.100 (0.245)	0.271 (0.249)	0.663* (0.261)	0.263* (0.123)
<i>COMPETE</i>									-0.038 (0.085)	-0.021 (0.087)	-0.030 (0.079)	0.087 (0.085)	-0.016 (0.042)
<i>AGE</i>									0.006 (0.006)	0.002 (0.006)	0.003 (0.006)	0.002 (0.006)	0.003 (0.003)
<i>FEMALE</i>									0.196 (0.135)	0.100 (0.137)	-0.011 (0.127)	0.251 (0.139)	0.114 (0.067)
<i>RANK</i> *SAL_LO													-0.036 (0.041)
<i>RANK</i> *SAL_HI													-0.046 (0.041)
<i>RANK</i> *FLAT													-0.089* (0.040)
SAL_LO													0.096 (0.163)
SAL_HI													0.260 (0.164)
FLAT													0.433** (0.161)
$\alpha$	-0.000 (0.078)	-0.008 (0.078)	0.143 (0.079)	0.267** (0.078)	-0.234* (0.112)	-0.156 (0.118)	0.015 (0.117)	0.180 (0.114)	-1.165* (0.463)	-0.654 (0.508)	-0.208 (0.434)	-1.493** (0.470)	-0.974** (0.244)
N	603	606	609	597	603	606	609	597	603	606	609	597	2415
N Cluster	201	202	203	199	201	202	203	199	201	202	203	199	805
Chi <sup>2</sup>	9.570	6.196	3.931	0.045	16.011	6.922	5.101	0.612	28.717	11.058	9.861	26.677	66.212

SAL\_LO. However, only the introduction of flat incentives for professionals moderates rank-driven behavior in Treatment FLAT, rendering variables *UNDERPERFORM* and *RANK* insignificant (columns (4) and (8)). This is further supported by the significant interaction term *RANK*\*FLAT (see column (13) ALL). Hence, rank-driven behavior is significantly reduced with flat incentives compared to professionals investing on behalf of their own (Treatment OWN). Importantly, rank-driven behavior in Treatment FLAT is indifferent to the equivalent treatment with linear incentives, i.e., Treatment SAL\_HI (Wald coefficient test of the corresponding interaction terms in column ALL;  $p=0.296$ ). This indicates only weak and tentative evidence that rank-driven behavior when investing for others gets reduced when professionals are exposed to flat incentives.<sup>18</sup>

Focusing on the control variables of professionals' risk taking, we find that professionals' beliefs about customers' willingness to take risks (*RISKCUST*) do not explain risk taking. The most significant control variable explaining risk taking in the investment game is professionals' self-assessed risk attitude in financial matters.

<sup>18</sup> Because of no observations for Treatment OWN we dropped variable *RISKCUST* in analysis ALL. This variable is insignificant in all other treatments and hence we do not lose explanatory power by dropping it.

Here, *RISKFIN* exhibits positive effect sizes in all treatments, significant coefficients in two treatments and on aggregate (column (13) ALL of Table 1).<sup>19</sup> Taken together, this finding is in line with the empirical observations of Foerster et al. (2017). They report results from Canadian households and financial advisers and show that advisor fixed effects explain considerably more variation in household portfolio risk than a broad set of investor attributes, including risk attitudes, age, investment horizon, and financial sophistication. Our finding is also in line with Linnainmaa et al. (2019) who report from a large sample of Canadian financial advisers and their clients. The authors show that most advisors invest their personal portfolios just like they advise their clients. In particular, they trade too much, chase returns, prefer expensive, actively managed funds, and underdiversify.

Loss tolerance (*LOSSTOL*) also explains risk taking in the investment game, but to a smaller degree, with significant coefficients only for Treatment FLAT and on aggregate. All other variables, including age, gender, and professionals' willingness to compete, do

<sup>19</sup> The coefficients of *RISKFIN* for treatments SAL\_LO and SAL\_HI are insignificant on a 5%-level. However, both coefficients are relatively close to the 5%-level with z-values of 1.92 and 1.41, respectively.

not systematically explain professionals' risk taking in the investment game.<sup>20</sup>

In addition, we only find a significant risky shift when deciding on behalf of a third party in Treatment FLAT compared to deciding on one's own behalf in Treatment OWN (column (13) ALL). For the comparison of Treatment FLAT with treatments SAL\_LO and SAL\_HI, we run Wald coefficient tests. We find significant higher risk taking in Treatment FLAT than in SAL\_LO (pairwise Wald coefficient test of the coefficients in column ALL;  $p=0.041$  for FLAT vs SAL\_LO and  $p=0.296$  for FLAT vs SAL\_HI). We also show in a joint analysis, testing for differences across all three treatments, insignificant results (Wald coefficient test for equality of all three treatments;  $p=0.124$ ). Following previous studies by Füllbrunn and Luhan (2017), we thus conjecture that potentially risk aversion and loss aversion decrease because of less emotional engagement when investing other peoples' money and when incentives are not aligned (compared to deciding on one's own behalf). However, note that we only report a mild effect.

Importantly, variable FEMALE mainly exhibits insignificant coefficients in Table 1, indicating that gender differences play no role. We consciously recruited about 50% female professionals in each treatment, letting us investigate gender differences in detail. In Table A.2 in the online appendix, we add RANK\*FEM as an additional explanatory variable. This variable is an interaction term of RANK and the female dummy, measuring women's rank-driven behavior compared to men's (measured with RANK). We find no significant coefficients, implying that the rank-driven behavior of female professionals is indistinguishable from male professionals', as already outlined by Kirchler et al. (2018).<sup>21</sup>

In addition, we investigate whether there is a difference in behavior between professionals who are in direct contact with customers and those that are not. In particular, we run the regression of Table 1 (column (13) ALL) only with those professionals with direct customer contact (i.e., compliance, client advisor, customer support, fund placement, investment advisor, investment banking, private equity/banking, relationship manager, sales) in one specification and with those professionals without direct customer contact in another specification. As outlined in columns 3 and 4 of Table A.3 in the online appendix, we find that coefficients are very similar across both sub-pools of professionals with slightly lowered significance levels due to lowered sample sizes. Thus, we infer that the effects observed in our study are a general finding, applying to professionals with and without direct customer contact in their daily job. In addition, we added fixed effects for each job function as outlined in column 2 of Table A.3 in the online appendix. We show that results do not change when adding job function fixed effects, indicating that job functions do not necessarily drive our main result.

As a robustness check for Experiment OPM we recruited another 160 financial professionals and administered a second experiment, OPMLAB, with a mobile laboratory in the field (see online appendix A.2 for details on the design and results). This experiment is a modified setting of the lab-in-the-field investment experiment in Kirchler et al. (2018) with the focus on professionals' decision making for real customers. The results from the lab-in-the-field experiment OPMLAB corroborate our findings from the online experiment OPM by showing that rank-driven behavior is activated once professionals' incentives are no longer flat. Here, underperforming professionals increase their risk taking when investing customers' funds compared to their outper-

forming peers. Again, we also find a null result in the treatment with professionals' flat incentives, providing tentative evidence that rank-driven behavior could be moderated when incentives are flat.

## 2. Online survey evidence for preferences regarding relative performance, competitiveness, and risk

Our results in this paper so far and the findings in Kirchler et al. (2018) reveal that the rank-driven behavior of financial professionals is robust across various settings, including investment decisions for others. This raises the question to what extent financial professionals differ in their rank-driven behavior compared to other groups, such as their customers. If customers are equally rank-driven as professionals, it is possible that customers not only enjoy the monetary, but also the non-monetary benefits from their investment manager's (or private banker's), outperforming their peers. Hence, if customers benefit from the higher ranking, the rank-driven behavior of professionals could be in the interests of customers, as it directly translates into non-monetary customer benefits. If, however, preferences for relative performance are stronger for professionals than the average customer, then any increased risk taking due to social competition among peers is at least partly violating customer interests. Given the performance-oriented business culture in the financial industry and the possibility that very competitive individuals self-select into this sector and are shaped by it, financial professionals might differ from other groups in their preferences for relative performance, competitiveness, and risk.

To shed more light on the role that professionals' individual characteristics might play, we administered an online survey to financial professionals, a representative general population sample, and individuals from other competitive professions like professional sports and academia (the survey questions are outlined in the online appendix A.5). In particular, we asked survey questions measuring risk attitudes according to the German SOEP (Dohmen et al., 2011) and attitudes toward social status, financial success, and relative performance like in Cohn et al. (2014, 2017).<sup>22</sup> In addition, we asked for preferences regarding social status and relative performance in specific domains (job, hobbies, family, friends) and how self-perceived attitudes towards social status and relative performance developed during childhood and adolescence.<sup>23</sup>

Finally, alongside general demographic questions such as age, gender, income, profession, and hierarchy level, we added the five-item competition subscale of the Work and Family Orientation (WOFO) questionnaire of Helmreich and Spence (1978), as in Experiment OPM. The WOFO subscale, which is a widely used psychometric measure of individuals' competitiveness, serves as a robustness check for the single-item question on relative performance (see online appendix A.5 for the exact wording of the survey). In further analyses, we have rescaled the WOFO score to a 7-point Likert scale to make it comparable with other variables.

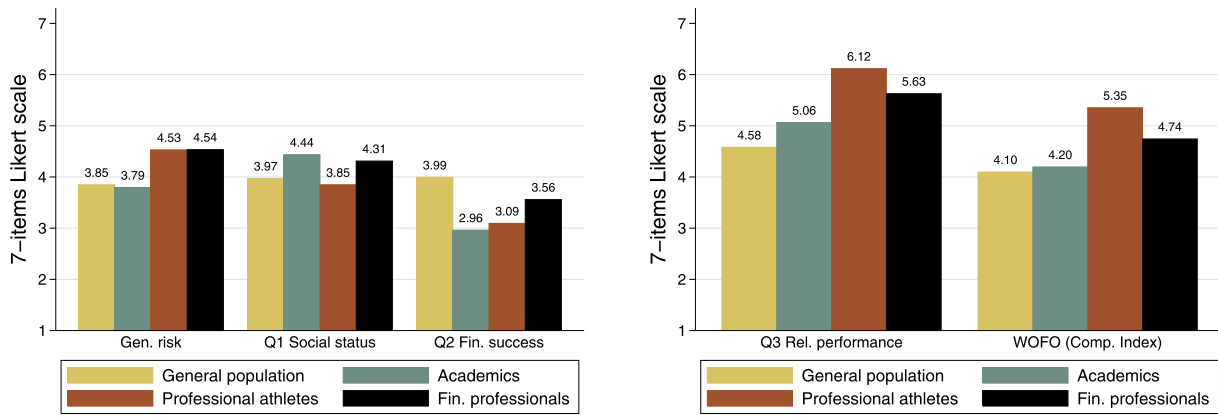
In total, we recruited 1000 respondents from two general population samples, 120 professional athletes from individual and team

<sup>22</sup> Q1 (SOCIAL\_STATUS): "How important is it for you what others think about you?"; Q2 (FINANCIAL\_SUCCESS): "Social status is primarily defined by financial success." Q3 (RELATIVE\_PERFORMANCE): "How important is it for you to be the best at what you do?" Answers to all questions were given on a 7-point Likert scale ranging from 1 (not important) to 7 (very important).

<sup>23</sup> Survey participants had to self-report their attitudes at ages 4–10, 11–18, and 19–25. The wording was as follows (e.g., for 19–25): "Think about your time as a young adult from age 19 to 25. How important was it for you what others thought about you?" We readily acknowledge that the answers to questions about earlier periods should be treated with great care, because looking back can deliver consistency—or elicit hindsight-biased responses.

<sup>20</sup> Note that participants' attitudes toward social comparison using the three questions from Cohn et al. (2014, 2017) also do not explain risk taking.

<sup>21</sup> Moreover, we ran the regressions of Table 1 with the subsample of female professionals and found very similar results overall with respect to the full sample. Results can be provided upon request.



**Fig. 2.** Online Survey: Evidence of Preferences for Risk, Social Status, Financial Success, Relative Performance, and Competitiveness for Different Subject Pools. This figure shows the average survey responses of samples of the general population ( $N=1000$ ), academics ( $N=104$ ), professional athletes ( $N=120$ ), and financial professionals ( $N=125$ ) for general risk taking (*GENERAL\_RISK*, the self-reported willingness to take risks from the GSOEP (scaled to a 7-point Likert)), *SOCIAL\_STATUS*, *FINANCIAL\_SUCCESS*, and *RELATIVE\_PERFORMANCE* (representing the answers to corresponding survey questions on a 7-point Likert scale taken from Cohn et al. (2014, 2017), with higher values indicating stronger preferences). The WOFO (*COMPETITIVENESS\_INDEX*) is the aggregate outcome of the five-item WOFO test on competitiveness (scaled to a 7-point Likert).

**Table 2**

Online Survey: Univariate Analysis of Preferences for Relative Performance, Status, Financial Success, and Risk Attitudes for Different Subject Pools. This table shows a univariate analysis of samples of the general population ( $N=1000$ ), academics ( $N=104$ ), professional athletes ( $N=120$ ), and financial professionals ( $N=125$ ) for the following variables: *SOCIAL\_STATUS*, *FINANCIAL\_SUCCESS*, and *RELATIVE\_PERFORMANCE* represent the answers to corresponding survey questions on a 7-point Likert scale (higher values indicate stronger preferences). For all three questions, the preferences were also elicited for different areas such as one’s job, hobbies, family, and friends. *GENERAL\_RISK* is the self-reported willingness to take risks (11-point Likert scale from 0 to 10; higher values indicate stronger preferences). *COMPETITIVENESS\_INDEX* is the aggregate outcome of the five-item WOFO test on competitiveness by Helmreich and Spence (1978) (five-point Likert scales; higher values indicate stronger preferences). In addition, \*\* and \* represent significance at the 1% and 5% levels of double-sided Mann-Whitney U-tests, respectively. Headers of pairwise tests involving financial professionals are written in **bold**.

Variable	Subject pools				MW U-tests ( Z-values )					
	GEN POP	ACA-DEMICS	PROF ATHL	FIN PROF	GEN vs ACAD	GEN vs ATHL	<b>GEN vs FIN</b>	ACAD vs ATHL	<b>ACAD vs FIN</b>	<b>ATHL vs FIN</b>
<i>SOCIAL_STATUS</i>	3.97	4.44	3.85	4.31	2.315*	0.882	2.021*	2.712**	0.548	2.431*
<i>SOCIAL_STATUS_JOB</i>	4.84	5.13	4.66	5.34	0.944	1.640	2.618**	2.070*	1.107	3.603**
<i>SOCIAL_STATUS_HOBBIES</i>	3.73	3.41	2.91	3.06	1.727	4.823**	4.067**	1.846	1.345	0.519
<i>SOCIAL_STATUS_FAMILY</i>	4.72	4.80	4.59	4.73	0.069	0.712	0.242	0.594	0.277	0.370
<i>SOCIAL_STATUS_FRIENDS</i>	4.74	4.51	4.37	4.62	1.745	2.573*	1.484	0.590	0.492	1.155
<i>FINANCIAL_SUCCESS</i>	3.99	2.96	3.09	3.56	4.793**	5.455**	2.767**	0.828	2.667**	2.296*
<i>RELATIVE_PERFORMANCE</i>	4.58	5.06	6.12	5.63	2.713**	10.443**	7.427**	5.493**	2.846**	3.816**
<i>RELATIVE_PERFORMANCE_JOB</i>	5.01	5.46	6.51	5.98	2.688**	11.311**	7.285**	6.143**	2.643**	4.717**
<i>RELATIVE_PERFORMANCE_HOBBIES</i>	4.15	3.90	4.23	3.86	1.119	0.219	1.744	1.208	0.106	1.717
<i>RELATIVE_PERFORMANCE_FAMILY</i>	4.51	3.91	3.74	4.53	2.528*	3.998**	0.892	0.608	2.101*	3.069**
<i>RELATIVE_PERFORMANCE_FRIENDS</i>	4.45	3.78	4.01	4.46	3.185**	3.022**	0.012	0.892	2.694**	2.428*
<i>GENERAL_RISK</i>	6.05	5.96	7.12	7.13	0.342	4.613**	4.815**	3.281**	3.330**	0.085
<i>COMPETITIVENESS_INDEX</i>	2.93	3.00	3.82	3.39	0.876	10.685**	6.137**	6.582**	3.158**	4.973**
N	1000	104	120	125						
Percentage FEMALE	49.90	19.23	17.50	12.80						

sports, 104 academics (from PhD candidates to full professors), and 125 financial professionals that share the same characteristics as the professionals in our experiment. For the professional athletes, the major selection criterion was that sports had to be their major or sole income source. All of the athletes in this sample competed regularly on an international level. Notably, all the non-financial professional samples were selected from the same countries as the sample of financial professionals in Experiment OPLAB and the survey.

Fig. 2 outlines the most relevant results. In addition, Table 2 adds pairwise Mann-Whitney U-tests, to which we refer in all the comparisons that follow.<sup>24</sup> For our main variable, *RELATIVE\_PERFORMANCE*, we find a clear pattern. Being the best is the most important for professional athletes, followed by financial professionals, and then—with a clear margin—by academics and respondents from the general population. These results are supported by the aggregate outcome of the *COMPETITIVENESS\_INDEX*

(five-item WOFO competitiveness subscale), showing the same ordinal ranking across subject pools regarding the importance of being competitive and winning in competitions (in our data, the internal reliability of the WOFO subscale is high with a Cronbach’s  $\alpha$  of 0.839). Moreover, relative performance is significantly more important on the job than in any other area of life. This pattern holds for all subject pools, but is particularly pronounced for financial professionals and athletes. The general question on relative performance and the job domain are the only domains where financial professionals have significantly stronger concerns for relative performance than both academics and the general population. Interestingly, differences across subject pools are less pronounced regarding social status. Here, financial professionals share the top position with academics. Financial success is considered important by financial professionals and the general population. The role of financial success is considered significantly less important by professional athletes and academics. Particularly financial professionals and professional athletes stand out in their general level of risk taking and show significantly higher values compared to all other subject pools.

<sup>24</sup> Importantly, when we mention distinctions between groups, we only refer to statistically significant differences, as reported in Table 2.



We also compared financial professionals with the sub-sample of the general population with an annual gross household income of \$60,000 to \$79,999 or higher—i.e., households with an income at or above the median household income of \$63,179 in 2018 (according to the U.S. Census Bureau statistics).<sup>25</sup> Our sub-sample therefore includes the richer part of the population, which may be more likely to use the services of financial professionals. In line with the results above, we find that financial professionals have significantly higher values than respondents from richer households for all variables shown in Fig. 2: general risk ( $p = 0.002$ ), social status ( $p = 0.022$ ), financial success ( $p = 0.000$ ), relative performance ( $p = 0.000$ ), and competitiveness ( $p = 0.004$ ).<sup>26</sup>

These survey results point out that financial professionals share similar preferences in crucial professional characteristics with professional athletes. Both groups consider competition and being the best in competitions very important, particularly in their professional life, and thereby differ from the general population and academics. In addition, they both report taking more risks than the other subject pools. These findings further support our results from the experiments in this paper and in Kirchler et al. (2018), showing that professionals react to rankings and show concern for their relative performance in a broad range of investment tasks.<sup>27</sup>

### 3. Conclusion and discussion

In this paper, we provided causal evidence of how rank incentives affect professionals' risk taking when investing real money for third parties (customers). Despite the emerging literature on rank incentives (e.g., Roussanov, 2010; Kirchler et al., 2018) and on delegated decision making in finance (e.g., Agranov et al., 2013; Anderson et al., 2013; 2016), this paper's innovation is that (i) financial professionals acted as investment managers by (ii) investing real money from clients, when (iii) rank incentives were in place. We conducted an online experiment with 805 financial professionals, a lab-in-the-field experiment with another 160 professionals as robustness check, and an online survey with 1349 respondents from the general population, the finance industry, and other competitive professions.

First, we showed that rankings drove professionals' behavior on behalf of customers, especially when professionals' incentives were linear and thus aligned with the ones of the customers. In particular, we found that professionals that were lagging in the ranking increased their risk taking (compared to their peers) when investing other people's money, and this rank-driven behavior did not differ from professionals' behavior when they were investing for themselves (i.e., identical (linear) incentives in both settings). Moreover, we reported tentative evidence that rank-driven risk tak-

<sup>25</sup> This variable was optional and 467 of the 1000 survey respondents self-reported their income (at the time of the survey). All analyses are available upon request.

<sup>26</sup> Another robustness check with respondents with an above median annual personal income (gross) provides similar results, albeit with marginal significance of SOCIAL\_STATUS ( $p = 0.054$ ).

<sup>27</sup> Figure A.1 in the online appendix depicts participants' self-reported development of preferences for social status and relative performance since childhood. We found that the importance of relative performance varied significantly between most subject pools at a very young age (4–10 years). At the ages of 11–18, most groups have reached current levels. However, financial professionals' preference for relative performance steadily increases over all age groups (a Cuzick trend test shows a significantly increasing trend for financial professionals with  $p = 0.000$ ). Although these analyses should be treated with great care for the aforementioned reasons, they indicate that general differences in competitiveness and in relative performance across groups may already vary at a young age. Moreover, this is a hint that the profession and the business culture in the financial industry further shapes and accentuates professionals' concerns for relative performance. This contrasts with preferences for social status, which declines after the age of 18 and where professionals do not differ from other groups (a Cuzick trend test shows that all groups have a declining trend after age 18 with  $p = 0.003$ ).

ing on behalf of others got weaker as soon as professionals' incentives were flat. We acknowledge that, of course, the absence of a significant effect size does not mean that there is no effect. This indicates that larger sample sizes could potentially turn the effect sizes in the treatments with flat incentives to become significant as well. Hence, we conservatively interpret the absence of a rank effect in these treatments as a tentative result. More research in this area is needed to find out whether these results will hold in light of larger sample sizes.

Second, we found that professionals' perceived risk attitudes of customers did not drive their behavior in the online experiment. In contrast, professionals mainly focused on their own individual risk attitudes and their own level of loss aversion when making decisions for clients. In the light of regulatory efforts to increase the transparency and awareness about clients' preferences and risk attitudes, this is a worrying finding, which calls for further investigation.

Finally, we reported that professionals stood out in their self-reported importance of relative performance compared to the general population and to academics, nearing the high level of professional athletes. Professionals also differed from the general population in other aspects, like higher status concerns and elevated risk preferences. These findings indicate that rank-driven behavior is rooted in special attitudes among financial professionals, including strong concerns about relative performance compared to their peers.

In general, this paper addresses an important feature of the finance industry—i.e., professionals primarily manage funds from third parties. However, in some areas of the finance industry, like in trading, customers are less salient in professionals' daily activities. Although professionals invest other people's money, individual incentives—be it non-monetary rankings or convex tournament and bonus schemes—are likely to be more salient and important. In this case, the results of Kirchler et al. (2018), showing robust rank-driven behavior when professionals invest for themselves by solely focusing on their rank incentives or tournament incentives, are probably more relevant. For areas like private banking and financial advice, customers are more salient in everyday decisions. Here, professionals interact regularly with customers and frequently face incentives that are flat or moderately aligned with customers' portfolio performance. Thus, the results of this paper, which cover situations with more salient clients, are probably more relevant for these particular areas in the finance industry. However, one limitation of our study could still be that, although professionals are aware that they invest for others and that there is real client money on the table, the identity of the customers is still anonymous. Hence, some effects could vary in light of lifting the anonymity of the customers. However, we leave this issue for future research.

Our findings provide implications for professionals' investment decisions outside the laboratory. Underperforming professionals' increased appetite for risk implies that regulating bonus incentives might be ineffective as long as social competition also drives behavior. In addition, the fact that professionals mainly invested according to their individual attitudes for risk and loss and did not account for their perceived customers' risk attitudes is a potentially worrying finding. As Foerster et al. (2017) and Linnainmaa et al. (2019) point out empirically, financial advisors typically invest personally just as they advise their clients. These findings could loosely be related to the well-documented “false consensus effect”, indicating the tendency to believe that others' preferences are closer to ours than they actually are (e.g., Mullen et al., 1985).

However, it seems interesting that professionals' detrimental competition for rank could be moderated—according to our tentative evidence—by decoupling their incentives from customers'

portfolio performance. Based on our study, we could conservatively conclude that, together with increasing customer salience and with an even stronger focus on the client, this combination could lead to better portfolio management, accounting less for the advisers' preferences and their idiosyncratic competitive and status concerns. However, we also acknowledge that pure rank incentives might trigger rank-driven behavior even with non-aligned incentives on real financial markets, as career concerns could promote rank-driven behavior—i.e., a feature which is impossible to model in the lab. Moreover, when investment goals take the trade-off between risk and return into account, the salience of raw returns (that determine the rank) may be reduced.

Nevertheless, decoupling professionals' incentives from performance in general could be detrimental in some sectors of the finance industry (e.g., investment banking, mergers and acquisitions), as professionals' efforts might decrease in quality and/or quantity (e.g., [Blanes-i-Vidal and Nossol, 2011](#)). Hence, future research should focus more on the effects of rank and tournament incentives and the joint changes in risk taking and effort provision for different sector-specific tasks within the finance industry. Our study also suggests that more lab-in-the-field experiments with industry professionals are useful and needed, particularly when specific features of the business culture are under causal investigation.

### Supplementary material

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.jbankfin.2020.105952](https://doi.org/10.1016/j.jbankfin.2020.105952).

### CRedit authorship contribution statement

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