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Investment Preferences and Risk Perception: Financial Agents versus Clients

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Abstract: We study three fundamental components of financial agency settings: Perception and communication of investment profiles, the interaction of agents' and clients' preferences, and the role of (non-)monetary incentives. The perception of investment profile terminology is very heterogeneous, resulting in substantial miscommunication between clients and agents. Financial agents show a high willingness to implement their clients' preferred investment profiles independent of monetary incentives. Agents' investments for their clients are biased by their own investment preferences.

JEL: D14, D83, G11, G21

Keywords: Decisions under risk, decisions of agents, risk perception, financial advice

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1 Introduction

As part of the revised Markets in Financial Instruments Directive (MiFID II) financial advisors in the European Union are obliged to assess their customers' personal attitudes towards taking risks, their risk tolerance, and their risk bearing capacity (Hallahan et al. 2004). Similarly, investment advisors in the United States face a *duty to inquire* and a *duty to give only suitable advice,* which entail assessments of the risk tolerance and risk bearing capacity of their clients. Clearly, these are neither easy nor clearly defined tasks and their implementation varies widely ranging from simple customer risk attitude questionnaires to behavioral measures of risk preferences (Grable and Lytton 1999; Kaufmann et al. 2013, Roszkowski and Grable 2005). Independent of jurisdiction, the goals of these regulatory efforts are to align the interests of clients and their agents to prevent the former from fraudulent exploitation by the latter.

Having assessed the risk and investment preferences of their clients, financial agents select products and make investment decisions. A multitude of factors has the potential to affect the decision-making process: The form of investment preference communication from clients to agents might be too unspecific to inform agents well; agents and clients might not share a common perception of risk and the riskiness of financial products[1]; or agents might be influenced by exogenous factors such as monetary incentives and company policies. Finally, agents' decisions for their clients might be willingly or unwillingly affected by agents' own preferences.

The goal of this paper is to systematically assess the role that several key components of this interaction play in determining investment behavior of financial agents for their clients. We study i) the perception of investment profile terminology which is commonly used in the financial industry; ii) the degree to which financial agents customize clients' portfolios when investment preferences are known; iii) the influence of agents' own investment preferences on their decisions for others; and iv) the role of monetary incentives in affecting agents' investment behavior.

Some of these elements have been studied before. Foerster et al. (2017) ask whether financial advisors customize portfolios to clients' preferences. Using investment preferences from Know Your Customer (KYC) forms and actual investment portfolio holdings, they find

[1] Bradbury et al. (2015) emphasize the importance of understanding the risks involved in investment decisions and show that these can be improved by simulating experience compared to survey-style risk assessment procedures. Relatedly, Glaser et al. (2019) demonstrate that risk perception concerning financial assets is sensitive to the presentation format.

that customization of portfolios to match different customers' needs is very limited. Agents' own risk attitudes are identified to be the strongest predictor for the risky investments on behalf of their clients. Despite the richness of the empirical datasets, the authors lack control compared to studies based on laboratory experiments. Specifically, it remains unclear how matching between agents and clients affects the results. Clients might deliberately select their agents based on a number of different and potentially unobservable characteristics. Similarly, it might be the case that agents simply use their own risk tolerance as their best predictor for clients' risk tolerance if the communication of risk preferences from clients to agents (via KYC forms) is sufficiently unspecific.

Using a tightly controlled laboratory setting with randomized treatment and role allocations, we are able to address these open questions and add the crucial factors of investment preference perception and incentive systems. In the experiment, we elicit participants' perceptions of common investment profile terminology used in financial advice, let clients communicate their preferred profile to their agent, and observe the agents' subsequent investment decisions. This lets us test whether the strong effects of agents' own preferences reported by Foerster et al. (2017) survive in a more tightly controlled setting which rules out selection effects by design. We also ask whether customization of client portfolios takes place and how different compensation schemes affect agents' decisions.

In a comprehensive 2-by-3 between-subject design, agents either take a decision for only one client or for a group of five clients and receive a fixed payment or earn a share of the profit or the client's outcome. In the first part of our experiment, participants individually and privately map a set of investment profiles, which range in wording from "very conservative" to "aggressive growth," to investment shares into a risky asset. The terms used to describe the investment profiles are commonly used in financial advisory documents (Mutual Fund Dealers Association of Canada 2014, subsequently MFDA). In the second part, participants take a Gneezy and Potters (1997) investment decision: Clients choose one of the five investment profiles which is subsequently communicated to their financial agent. Knowing their clients' preferred strategies, financial agents then decide how much of their clients' endowments to invest in the risky asset.

We find considerable heterogeneity in the perception of investment profiles and are able to trace mismatches between invested amounts and investment preferences back to differences in perceptions between agents and clients. We carefully examine the behavior of agents given their own perception of the investment profiles and find considerable customization of client

portfolios to their preferences. Observations from our Group treatment reveal that tailoring of investments to clients' preferences does not only occur on the aggregate, but also on the individual level. Yet, agents' own investment preferences also affect their clients' portfolios. These results are in line with findings by Holmen et al. (2019) who find similar patterns for Swedish financial professionals and lay people. They are also similar to the empirical findings of Foerster et al. (2017), although the effect of agents' own preferences on invested amounts is substantially less pronounced in our experimental data.

Different compensation schemes, even with unambiguous monetary incentives to disregard clients' preferences, hardly affect the degree to which agents try to comply with their clients' stated investment preferences. This observation is consistent with the results of Holmen et al. (2019) and the evidence provided by Ifcher and Zarghamee (2018). The latter find agents to tend to act as surrogates for their principals. Even with strong financial incentives for the agents to disregard their clients' preferences, the clients' preferences still substantially determine the level of investments in their experiment. The observation that agents' financial motives do not affect their behavior much is corroborated by Rud et al. (2018), who show that financial incentives do not increase misreporting of agents to clients in their study of different market structures. We interpret this as evidence for a moral constraint in agent decision making. However, our results also suggest that, if incentive become strong, the impact of such moral constraints may be reduced.

Our experiment allows us to take an outcome perspective and ask whether clients get "what they want", i.e. whether the amount invested in the risky asset by their agent falls into the range of investment levels that the client associates with the investment profile they communicated. We find evidence of a substantial problem of communication between agents and clients: Although agents intend to invest in line with their clients' preferences and their perception of compatible investment levels, they often fail from their clients' perspective. We attribute this to differences in the perception of the investment profiles.

Finally, we run two additional treatments trying to remedy the communication problems and probing the robustness of our results. In the first, we remove uncertainty about the perception of the different investment strategies. This condition is aimed at removing the fundamental translation error between clients' and agents' understanding of the investment profiles. In the second treatment, we remove accountability and frame the experiment neutrally, instead of in a financial decision-making context. This condition allows us to assess the degree to which the possibility of holding agents accountable for their actions contributes to the large

proportion of agents who intend to implement their clients' preferences, despite facing monetary incentives to disregard them.

The remainder of the article is organized as follows: In the next section, we present a short overview of the existing literature on risk taking for others. In section 3, we present our experimental design and the procedures. Section 4 shows the results and section 5 provides a short discussion. Section 6 concludes.

2 Related Literature

A growing body of literature on financial decision making for others is focused on determining whether risky decisions for others are different from risky decisions for oneself. If a difference exists, the question of the direction emerges: Do financial agents take higher or lower levels of risk for their clients than they do for themselves? The evidence is mixed. This section provides a short overview of the existing literature. We start by providing some evidence for agents taking higher levels of risk when deciding for others.

Pollmann et al. (2014) employ the Gneezy and Potters (1997) investment task with agents taking decisions for one principal. Comparing their decisions to agents who decide for themselves, they find them taking more risk seeking investments when deciding for others. Furthermore, Andersson et al. (2014) use a multiple price list method to study risk taking for others both in situations when losses are possible and when they are not. They do not find any difference in risk levels taken between decisions for themselves and for others if losses are impossible. Still, participants' decisions involve more risk when deciding for others if losses are possible. Another finding is that higher levels of risk taking are primarily driven by a decrease in loss aversion. Hence, the authors conclude that making decisions for others has a de-biasing advantage over decisions for oneself. This is in line with the findings of Polman (2012). He shows in several studies that decisions for others involve less loss aversion than decisions for oneself. Pahlke et al. (2015) study the effect of responsibility for someone else's payoff on risk taking. In the gain domain, they find an increase in risk aversion for moderate and risk seeking for small probabilities. In the loss domain, they observe more risk seeking behavior. Due to their mixed findings, they reject the hypothesis of a general cautious shift when being responsible for other people's payoff.

By using both a multiple price list experiment as well as a first-price sealed-bid auction, Chakravarty et al. (2011) find that subjects are less risk averse when deciding for others as compared to deciding for themselves. Further, measuring beliefs, they find that agents do not

try to act in accordance with what they believe are the risk attitudes of their principals. Hsee and Weber (1997) investigate how people predict the risk preferences of others and examine possible mechanisms that people may use when estimating others' risk tolerance. They find evidence for the *Risk-as-Feeling*s hypothesis according to which "people predict others to have similar risk preferences to themselves, but they predict others to be more risk neutral than themselves" (Hsee and Weber 1997, p. 45). According to this hypothesis, people base their predictions of other peoples' risk preferences both on their own feelings towards risk as well as on risk neutrality because they face difficulties in imagining that people have feelings that are as strong as their ownThe extent to which people base predictions on their own feelings depends on how vivid the other person is. Roth et al. (2016) replicate the strong effect of own risk attitude in the prediction of other risk attitude.

Besides the findings of increased risk taking in decisions for others, there is also some evidence for lower levels of risk. Reynolds et al. (2009) compare decisions of participants when they decide between a safe and a risky option for themselves and when they decide between the same options for a group of people. They find them choosing higher levels of risk when deciding for themselves as compared to deciding for others. Eriksen and Kvaløy (2010) find that participants take significantly lower levels of risk when they make investments for other people as compared to making investments for themselves. The authors interpret this finding by means of the empathy gap (Loewenstein 1996) such that agents underestimate their principals' willingness to take risks. Montinari and Rancan (2018) use lotteries with negative expected returns. They find participants investing more for themselves than for friends. Yet, they do not find differences in investments for themselves and on behalf of a stranger. Bolton and Ockenfels (2010) let participants choose between a risky and a safe option. They compare the decisions when they affect the chooser's payoff only and when they affect both the chooser's as well as another participant's payoff and find that choices are more risk averse in the latter situation.[2] Füllbrunn and Luhan (2017) hold the variety of different designs responsible for the different results. They point out differences concerning the payoff alignment between agents and principals in the existing literature. On the one hand, agents take decisions for their principals only and earn a fixed payment.[3] On the other hand, the same decision is implemented for themselves.[4] In their own experiment, they find evidence for a cautious shift, which is

[2] This holds as long as choosing the safe option does not imply inequality to the detriment of the decision maker.

[3] Andersson et al. 2014, Chakravarty et al. 2011, Eriksen and Kvaløy 2010, Montinari and Rancan 2018, Pollmann et al. 2014, Polman 2012, and Reynolds et al. 2009.

[4] Andersson et al. 2014, Bolton and Ockenfels 2010, and Pahlke et al. 2015.

independent of payoff alignment. Additionally, they find that agents invest according to what they believe their principals wish to invest for themselves, which stands in contrast to Chakravarty et al. (2011). More recently, Füllbrunn and Luhan (2019) demonstrate that financial decision making for others is affected by different incentive schemes. With limited liability incentives, they find agents to take excessive risks, while without them a cautious shift is observed.

The key component missing from virtually all studies of financial decision making for others is communication, specifically, communication of investment preferences of clients to their agents. Absent communication, there is hardly any guideline for agents to follow, except for exogenously provided (monetary) incentives and their own preferences. In our experiment, we deliberately give clients the opportunity to communicate their preferred investment profile to their agent, thereby reducing the information asymmetry and providing agents with a guideline for behavior. Since we know the agents' perception of the investment profiles, we can distinguish two reasons why eventual mismatches happen ex-post: Either the agent deliberately chooses not to follow the client's preferred profile *or* he intends to follow the client's request, but fails due to a divergent perception of the investment profile to implement.

3 Experimental Design

3.1 Overview

Over the course of our computerized laboratory experiment, participants pass three stages and take on both the role of a client and a financial agent. The experiment starts with the Profile Perception Stage, in which participants are asked to map investment profiles onto an investment scale ranging from 0% to 100%. In the Preference Stage, we elicit participants' own investment preferences as a client. Finally, we put them into the roles of financial agents to take an investment decision for other participants. In this Investment Stage, financial agents are informed about their clients' investment preferences before making their decision. The experiment concludes with a short demographic questionnaire.[5]

[5] All files necessary for replicating the experiment and the results will be made available on University of Heidelberg's data repository at http://heidata.uni-heidelberg.de/dataverse/awiexeco

3.2 Investment Profile Perception

In the Profile Perception Stage, we present participants with investment profile names, which are commonly used in the financial industry.[6] Participants learn that there are two investment opportunities: a safe and a risky asset. We then ask each participant to map the investment profiles into ranges of investment amounts in the risky asset on a scale from 0% to 100%. That is, we ask participants to reveal which levels of investment into a risky asset they think of when confronted with each investment profile. We enforce consistency, i.e. that investment profiles which imply greater risk appetite than others cannot be mapped into lower risky investment levels. The Profile Perception Stage provides us with an individual measure of how participants perceive the investment profiles in a setup that is patterned on the Gneezy and Potters (1997) task, but stops short of explaining the mechanics of the risky asset in detail.

Figure 1, Panel A shows the starting point of the mapping procedure as it was presented to the participants on their screens. Starting with the investment profile *very conservative* participants can successively drag and drop each profile box onto the scale. Participants can adjust the size of each box, i.e. adjust lower and upper limits of an investment amount in the risky asset such that it matches their perception of the investment profile. Panel B shows an example of an intermediate step in the elicitation process. In this example, the participant has already mapped two of the profiles to risky investment levels and has adjusted the ranges they cover. Panel C finally shows an example of the completed elicitation process. The participant perceives a risky asset share of roughly 0-10% to match a v*ery conservative* profile. The *conservative income* profile covers a wide range of risky asset shares from approximately 10% to 50%. A risky asset share of 50-70% maps into a *balanced* profile. Finally, 70% to 80% and 80% to 100% are considered adequate for *growth* and *aggressive growth* profiles, respectively. Note that the full range of 0% to 100% had to be covered by the five profiles. Simply dragging them onto the scale was not enough, as they would only cover about 80% of the range by default. Participants had to adjust the size of at least one profile to be able to continue. This was implemented to make sure participants had to familiarize themselves with the range adjustment feature.

[6] These are used by the Mutual Fund Dealers Association of Canada (2014).

Figure 1: Investment Profile Perception Elicitation

Notes: The figure shows the process of the investment profile perception elicitation. Panel A shows the starting point of the mapping procedure as it was presented to the participants on their screens. Panel B shows an example of an intermediate step in the elicitation process. In this example, the participant has already mapped two of the profiles to risky investment levels and has adjusted the ranges they cover. Panel C finally shows an example of the completed elicitation process. Note that the full range of 0% to 100% had to be covered by the five profiles. An animated version is available at https://youtu.be/mcTX1QQX2f4.

At this point of the experiment, participants only know that there will be a risky and a safe asset. We consciously forgo a more detailed description of the assets in order to better resemble the situation in an actual financial advice setting. It is important that risk assessment tasks are free of complex details to foster understanding (MFDA 2014). Precise details of the financial products are typically only provided to clients at a later stage of the process, when the actual product selection takes place. In the preceding assessment stages, products are commonly abstracted away from and portfolio composition is presented in a simplified manner. They focus, for example, on the broad categories of equity and fixed income assets only (cf. sample investor profiles and asset allocations in MFDA 2014).

3.3 Investment Preferences

In the Preference Stage, we make participants familiar with the details of the Gneezy and Potters (1997) investment task in the agency setting: The client owns an endowment of 10 Euro, which the agent has to allocate between a safe and a risky asset. The risky asset resembles a lottery and has a return of $+250\%$ with probability $p = 1/3$ and a return of -100% with a probability of $1 - p = 2/3$. The expected return of the risky asset is 16.67%. The safe asset has a return of 0%. The agent decides to invest an amount $x \in [0,10]$ in the risky asset. The remainder $10 - x$

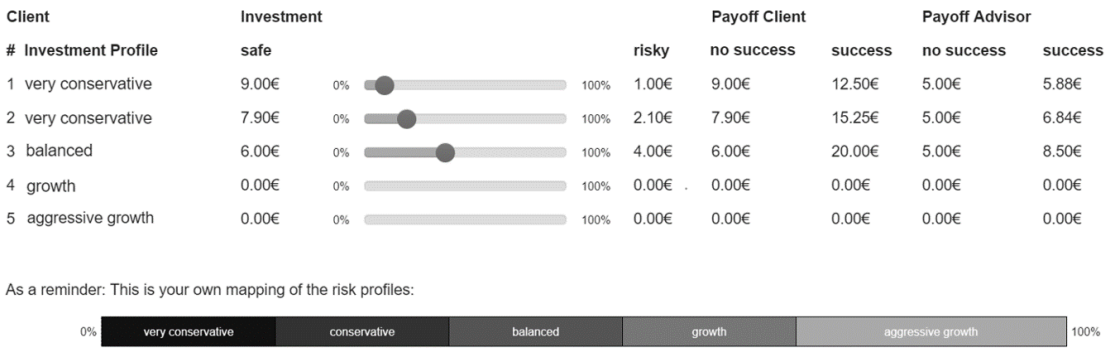
is automatically put into the safe asset. In this stage, all participants take on the role of a client and state their investment preference in the Gneezy-Potters task by selecting one of the investment profiles they already encountered in the Profile Perception Stage. The selected profile is then communicated to the agent in the Investment Stage. Participants are reminded that the preferred profile is communicated with the intention that the agent uses the information when making the investment decision. While this rather explicit demand for compliance with the clients' preferences might seem unconventional for a typical laboratory experiment, it is a very natural aspect in the context of financial agency. Clearly, all of the communication between clients and agents is aimed at informing and guiding the agents' subsequent actions in real-life situations. This is especially true if communication takes the form of an investment preference assessment initiated by the agent.

3.4 Investment Decisions

Finally, in the Investment Stage, all participants become financial agents and make the investment decision for their clients. In this stage, agents are informed about the investment profile selected by their clients in the Preference Stage. Agents are not bound by their clients' investment profile preference, but can freely choose any feasible investment in the risky asset. When deciding on how much to invest on their clients' behalf, agents have full information: For each client they see the preferred investment profile. For reference, they are also reminded of their own mapping of investment profiles into investment levels in the risky asset. Agents make their investment decision by moving a slider to set the risky investment for each one of their clients. Next to the slider, agents see the clients' resulting minimum and maximum payoffs as well as their own resulting minimum and maximum agent payoffs. The payoff displays update with every move of a slider for instant feedback on the effects of different investment levels. Agents always take the investment decisions for all of their clients on the same screen before proceeding to the next stage. This allows them to easily differentiate investments between different profile preferences, if they intend to do so. Figure 2 shows an example of the decision screen.

At this point, agents and clients are also aware of a weak accountability mechanism: After learning about their payoff relevant role, the investment decision of their agent and their final payoff, clients are asked to send a short message to their agent expressing their (dis)satisfaction with the investment decision. The pre-defined messages read "I am [very satisfied / satisfied / dissatisfied / very dissatisfied] with your decision".

Figure 2: Agents' Decision Screens



Notes: The figure shows the lower half of the agents' decision screen in the Group treatments. The first column shows the investment profile communicated by each of the five clients. The next three columns show investments in the safe and risky assets as well as the decision slider, which is used to allocate the endowment between the two. In this example, the decision maker has already set investments for the first three clients, but has not started to select investments for the last two (no default slider position). The next two columns show the payoffs the clients receive in the investment success / no success cases. The final two columns show the corresponding payoffs to the agent. All values in the table update instantly with slider movements. Below the decision table, a reminder of the agent's own mapping of the investment profiles to investment shares in the risky asset is shown. An animated version is available at https://youtu.be/s7IS2FRWY1o.

3.5 Treatments

Using a 2-by-3 between-subject design, we systematically vary the number of clients on whose behalf agents have to take the investment decision as well as the payment scheme for agents. In the Single treatments, agents take the investment decision for exactly one client whereas in the Group treatments, agents take the decision for a total of five clients simultaneously. Agents can set the investment for each of their five clients individually. In the Fixed payment scheme, agents get a fixed payment for their investment decision. Under Limited Liability, agents get a fixed payment plus an additional share of the positive return of the investment decision. That is, they do not face any downside risk. Finally, in the Co-Investment condition, agents get a fixed payment and a share of their client's portfolio after the investment decision and its outcome have materialized.

Single and Group Treatments

In the Single treatments, the computer matches two participants within a session. We are particularly interested in situations in which a client's and an agent's preferred investment strategies differ. Therefore, we match them such that we observe the highest possible variability of investment preferences within pairs. Unbeknownst to them, both participants take the investment decision as agents for each other. After all investment decisions have been made,

one of the two participants in a pair is randomly selected to be the payoff-relevant agent, the other one becomes the client.

In the Group treatments, participants are allocated into groups of six. We introduce this treatment in order to increase the probability of agents observing heterogeneous investment preferences of their clients and hence being able to observe the extent of customization for individual agents. We again match groups to maximize the variability of preferred investment profiles. Every participant takes the investment decision as an agent for every one of the five other participants in the group. Finally, we randomly select three participants of each group to be the payoff-relevant agents and randomly match each one of them with one of the remaining three participants, who become clients. We choose three agents from each group in order to keep the probability of being an agent constant across treatments. Thus, participants in both the Single and Group conditions face a 50% probability of being paid according to their decisions as financial agents.

The group size of six participants is motivated by our desire to expose participants to the largest possible variation in investment strategies preferred by their agents. With a group size of six, each participant takes the decision for five clients, which is exactly the number of available investment profiles. Yet, only 4 out of the 108 Group treatment participants faced the maximum variety and observed five different investment profiles. 53 of the participants saw four different investment profiles and 47 encountered three different ones. Four participants only observed two different profiles and there was no case in which participants faced just one profile. In total, 96.3% of our participants saw at least three different investment profiles and were thus exposed to a reasonable degree of heterogeneity.

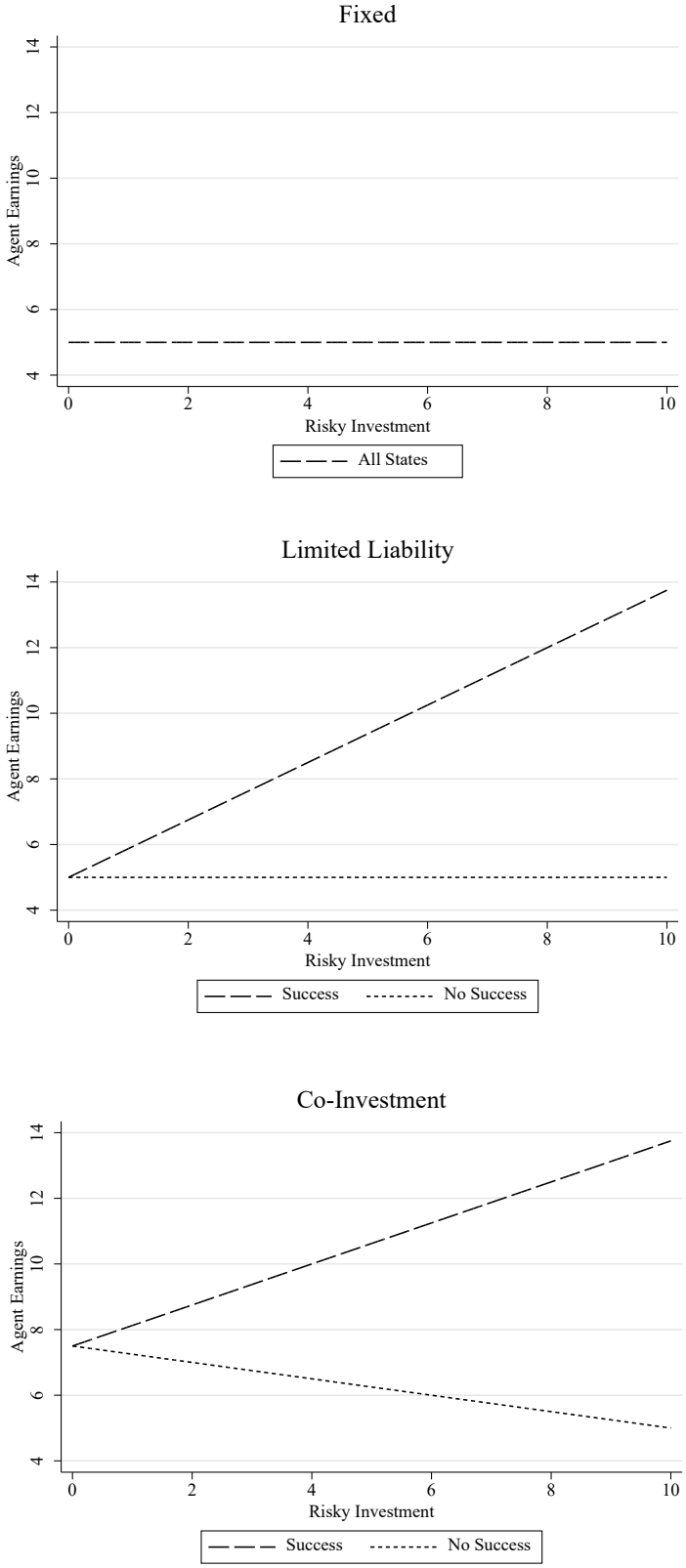
Payment Schemes

We further systematically vary three payment schemes put in place for the financial agents. Under all payment schemes, clients are paid according to the investment task. In the Fixed payment, scheme agents get a fixed payment of 5 Euro whereas in the Co-Investment and Limited Liability payment scheme, agents' pay is partially linked to their investment decision. Under the Limited Liability compensation scheme, agents receive a fixed payment of 5 Euro plus a share of 35% on the positive return of their corresponding clients. That is, agents do not face any downside risk, because their compensation is bounded below by the fixed payment, which is independent from investment success. However, they do have clear and substantial risk-taking incentives to increase their own expected payoff, creating a situation of limited liability.

The Co-Investment compensation scheme lies in between the two extremes. Under this compensation scheme, agents receive a fixed payment of 5 Euro plus a share of 25% on the payoff of their corresponding clients. In contrast to the Limited Liability treatment, agents face a downside risk because they can also lose by choosing riskier investments. Still, agents' expected earnings increase as they invest more in the risky asset. That is, agents face a similar payoff structure as their clients but in an attenuated form: The variance in payoffs is lower compared to their clients' and in worst case, they end up with a payoff of 5 Euro whereas their clients can end up with a payoff of zero.

To simplify the experiment, agents' compensations are always paid by the experimenter and do not come out of clients' portfolios. Figure 3 shows the agents' earnings as a function of the investment in the risky asset for our payment schemes.

Figure 3: Agents' Compensation Schemes

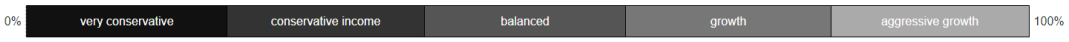


Notes: The figure shows the three payment schemes put in place for the financial agents. In the Fixed payment scheme agents get a fixed payment of 5 Euro. Under the Limited Liability compensation scheme, agents receive a fixed payment of 5 Euro plus a share of 35% on the positive return of their corresponding clients while under the Co-Investment compensation scheme, agents receive a fixed payment of 5 Euro plus a share of 25% on the payoff of their corresponding clients.

Additional Control Treatments

We also conduct two additional control treatments. The first aims at examining how the uncertainty surrounding the understanding of the investment profiles affects the decisions. Thus, in the *Certainty* treatment, we modify the profile perception stage, while all other stages stay unchanged. In contrast to our main treatments, we do not elicit participants' perception of each investment strategy. We rather establish a common understanding of these terms. This is done by showing participants the five investment profiles and explicitly defining how they are supposed to map into different investment levels.[7] Each investment profile now covers a fixed range of 20% as shown in Figure 4. Fixing the perception of the profiles removes the possibility of observing unintended mismatches: If an agent follows his client's preferred profile, the client will perceive the agent's behavior as in line with his investment request by design. If there is a mismatch, it must be because of agents deliberately choosing an investment that is incompatible with clients' preferences. The remaining experiment stays unchanged: Clients pick their preferred investment profile, which is communicated to their agent. Agents make the investment decisions. The compensation is analogous to the Limited Liability treatment. We only run the Single variant of our design for the Certainty condition.

Figure 4: Preference Perception Stage



Notes: In the Certainty treatment, we establish a common understanding of the investment strategies by fixing each interval to a size of 20%.

Note that our main treatments all include accountability aspects, which might be driving the effects we observe: 1) the experiment is framed in a finance context; 2) clients can tell their agents how they would like them to invest; and 3) clients can send messages expressing their satisfaction or dissatisfaction with their agents' decision after they learn about the investment decision and its outcome. Agents can anticipate these messages. Thus, in a second control condition, *No Accountability*, we remove these aspects. The instructions are neutrally framed[8], there is no elicitation and no explicit communication of investment preferences and clients can no longer express their satisfaction or dissatisfaction with the agents' decisions. In line with the first control condition, we again run the Single / Limited Liability variant only.

[7] We make sure participants engage with the scale and understand it correctly by asking additional comprehension questions in this treatment.

[8] For example, we use "decision maker" and "recipient" instead of "agent" and "client".

3.6 Procedures

The experiment was conducted AWI-Lab, the experimental laboratory at Heidelberg University in Germany in 2018. Sessions were organized with the software hroot (Bock et al. 2014) and the experiment was programmed using oTree (Chen et al. 2016). Participants entered the laboratory and were randomly placed at one of the 20 separated computers. All instructions were displayed on-screen and questions were answered in private. We ensure understanding of the instructions by letting participants advance through the instruction section only after answering a set of comprehension questions correctly. The experiment concluded with a short demographic questionnaire. Participants received cash payments in private and were dismissed from the laboratory. A total of 434 participants took part in the experiment (56.2% female, 30.2% economics students, average age: 23.0). In total, we ran 26 sessions (6x 3 for the main treatments and 2x 4 for the additional control conditions) with 324 participants in the main treatments and 110 participants in the controls. Each session lasted about 45 minutes and participants earned an average amount of 11.85 Euro including a show up fee of 4 Euro.

4 Results

Our main intention is to investigate what drives risky investment shares in an agency setting. To do so, we divide the analysis into two subparts. We focus on agents' behavior first and investigate whether they follow their clients' profiles or rather base their decision on their own risk preference. Next, we take on the perspective of clients and investigate whether they "get what they want." As an intermediate step, we examine how the perception of the investment profiles affects the decisions taken. Unless otherwise stated, we base the results on our six main treatment conditions. We only draw upon the data from our control conditions in the discussions in section five.

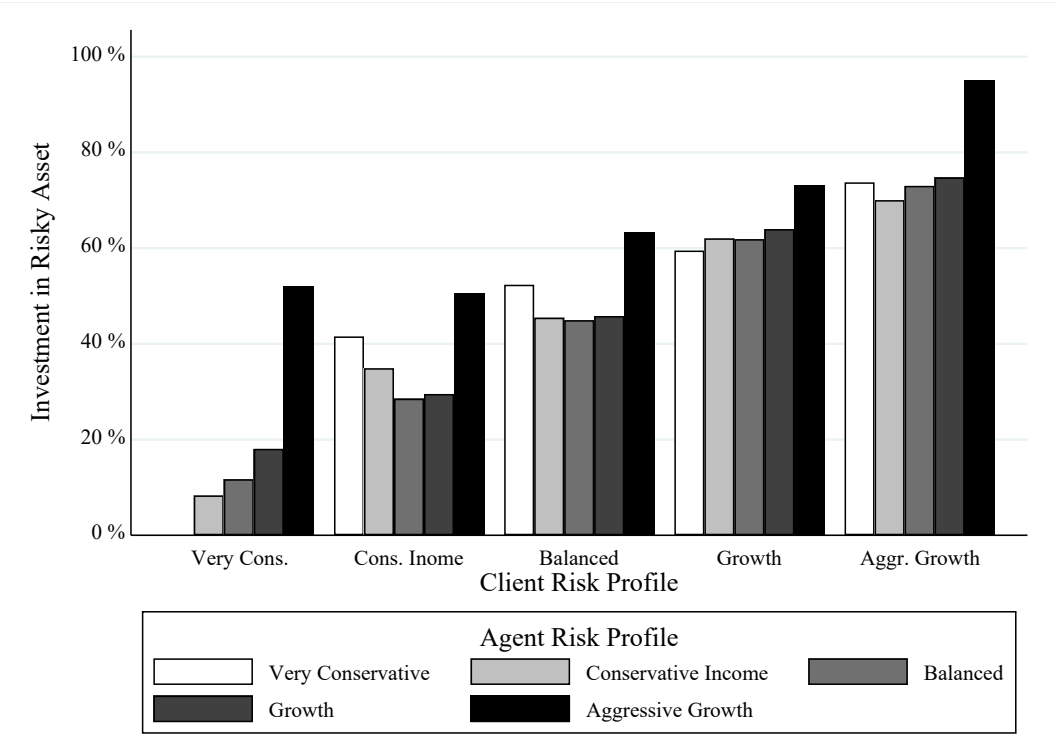
4.1 Agents' Behavior

Visual Inspection

We start our analysis by an examination of the investments in the risky asset. We are interested in whether agents follow their clients' preferred investment profiles or if they implement investments that correspond to their own risk preference. Figure 5 shows the average investment in the risky asset for different combinations for the clients' and agents' preferred investment profiles. In line with Foerster et al. (2017), we find that agents' own risk preferences influence the risk they take on behalf of their clients. Within each profile preferred by clients, we find

that the average investment in the risky asset increases with the preferred profile of the agent. A first visual inspection reveals that both the risk preference of the client as well as the risk preference of the agent seem to play a role when taking risky decisions on behalf of others.

Figure 5: Investment in the Risky Asset by Clients' and Agents' Profiles



Notes: This figure shows the average investments in the risky asset for each client and agent profile combination. Client Risk Profile refers to the preferred investment profile of the client while Agent Risk Profile refers to the preferred investment profile of an agent.

As a second step, we are interested in whether agents follow their clients' investment profile given how they perceive the scale of investments in the risky assets and the profile of their client. That is, we base the analysis in this section on whether agents implement the profile of their clients according to the agents' perception, irrespective of how the client themselves perceives the profile. Indeed, in 49.3% of the decisions over all main treatments, agents follow their clients' preferred investment profile.[9] This is despite the fact that none of our payment schemes provides incentives to follow the clients' wishes. In contrary, the Limited Liability conditions even unambiguously incentivizes agents to take risks above and beyond their client's preferences for own monetary gain.

[9] If we allow for a 'wiggle room' of 5 percentage points (0.50€ in the investment task) for the perception of the profiles, agents follow their clients in 59.9% of the decisions.

Table 1: Risky Investment Shares by Treatment Condition

	Compensation		
	Fixed	Co-Investment	Limited Liability
Single	47.8%	50.7%	50.9%
Group	46.9%	50.1%	56.5%

Notes: For treatment Single the number of observations is 54 for each compensation treatment. For Group it is 270, because we observe five investments decisions (not independent) for each participant.

Risky Investment Shares

Table 1 provides an overview of risky investment shares separated by treatment conditions. In order to investigate agents' investment behavior more formally and test for treatment differences, we use OLS regressions to estimate the investment in the risky asset. In specification (1), we regress the risky share on the agents' and the clients' preferred investment profiles, representing their risk preferences. In specification (2), we add treatment indicators and their interactions, as well as control variables. Table 2 reports the results. Disregarding treatment differences, clients' and agents' preferred investment strategies already explain a large fraction of the observed variation. The effect of clients' preference on the amount invested into the risky asset is larger than the effect of agents' preferences both in terms of statistical (F-test, p-value < 0.01 for specifications (1) and (2)) and economic significance. When considering our treatment conditions, we observe that investments are lower in the group conditions under fixed payments, but react differentially to the two other compensation schemes. We therefore conclude that agents base their investment decisions to large parts on their clients' preferences but also consider their own risk preferences. This is generally in line with the visual impression of Figure 5.

Table 2: Regression Analysis Investments in the Risky Asset

	Investment in Risky Asset	Investment in Risky Asset
	(1)	(2)
CI Treatment		0.02
		(0.35)
LL Treatment		-0.05
		(0.35)
Group Treatment		-0.44*
		(0.26)
CI × Group		0.92**
		(0.45)
LL × Group		0.88*
		(0.49)
Profile Client	1.49***	1.52***
	(0.07)	(0.07)
Profile Agent	0.28**	0.30**
	(0.13)	(0.13)
Age		0.05
		(0.03)
Female		0.01
		(0.24)
Constant	-0.60	-2.07**
	(0.47)	(0.87)
Observations	972	972
R^2	0.37	0.40

Notes: We report OLS regression coefficient estimates with robust standard errors in parentheses. The standard errors are clustered on the individual level. The dependent variable is investment in the risky asset. CI and LL indicate the treatment conditions Co-investment and Limited Liability, respectively. Profile Client indicates the category the client has chosen as preferred investment strategy. Profile Agent indicates the profile the agent has chosen as preferred investment strategy in the Preference Stage. ***/**/* indicate significance at 1%/5%/10%.

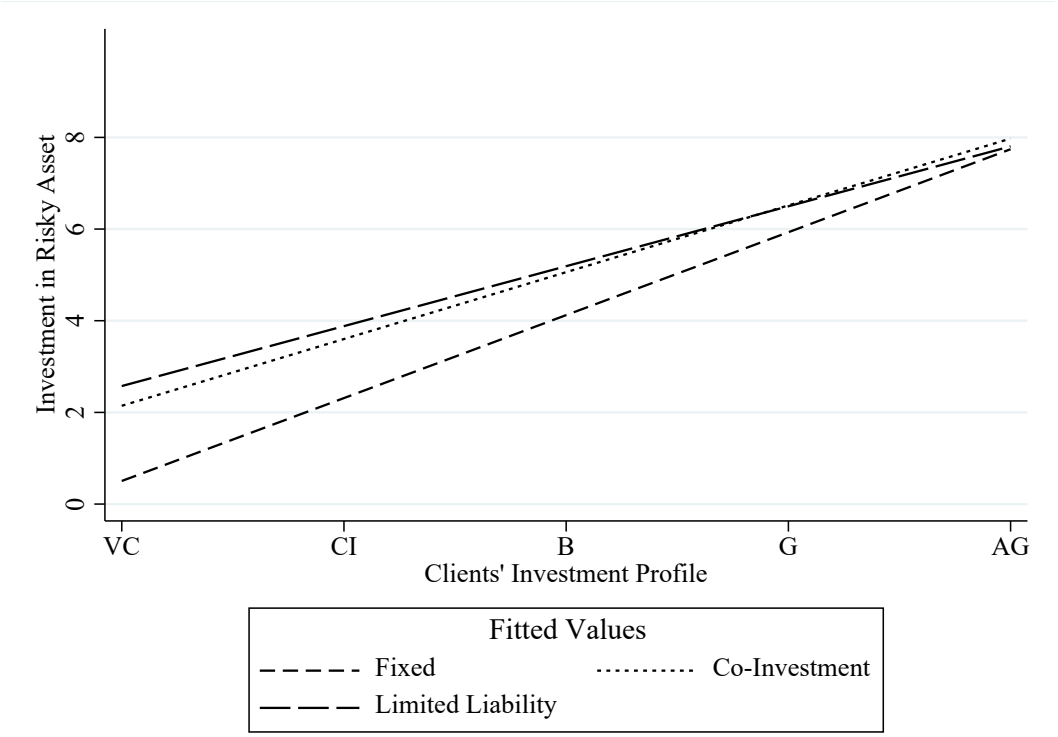
Portfolio Customization and Monetary Incentives

While we observe that about half of our agents do not invest in line with their clients' preferences, they might still have the intent to do so, but fail in implementing their intent. The group treatment makes the heterogeneity of different investment profiles among an agent's clients salient. The agents in this condition are aware that clients have different tastes. By measuring how strongly individual agents differentiate between clients with different investment profile preferences, we can uncover the agents' intentions to follow their clients' preferences. The more they take their clients into account, the stronger they should differentiate investments between profiles. The less importance they put on clients' preferences, the more similar should be the invested amounts for all clients. Furthermore, we are interested in whether

the compensation scheme affects the extent of differentiation between clients with different investment preferences.

Due to the monetary incentives under the Limited Liability compensation, we expect agents to invest more and differentiate less as compared to the Fixed treatment. Figure 6 shows the differentiation of agents' investments for their clients for our three compensation schemes (Appendix A shows the differentiation of each individual agent for each compensation treatments). The degree of differentiation is highest under the Fixed compensation and lowest under the Limited Liability compensation. The correlations between riskier investment preferences and actual investment are all positive and significantly different from zero (Fixed: $\rho = 0.79$, $p < 0.01$; Co-Investment: $\rho = 0.61$, $p < 0.01$; Limited Liability: $\rho = 0.49$, $p < 0.01$;, spearman correlation coefficients). The correlation between the clients' profiles and the investment in the risky asset is strongest under Fixed compensation and significantly larger than in the presence of incentives under Limited Liability (0.79 vs. 0.49 , $p < 0.01$) and Co-Investment compensation (0.79 vs. 0.61, $p = 0.055$). That is, we find high levels of customization of investments for clients. Even under the strongest of financial incentives, agents do not disregard their clients' preferences.

Figure 6: Risky Investments in Group Treatments by Compensation Scheme



Notes: The graph shows aggregated investments for each communicated investment profile in the Group conditions. We plot separately fitted values for each compensation scheme.

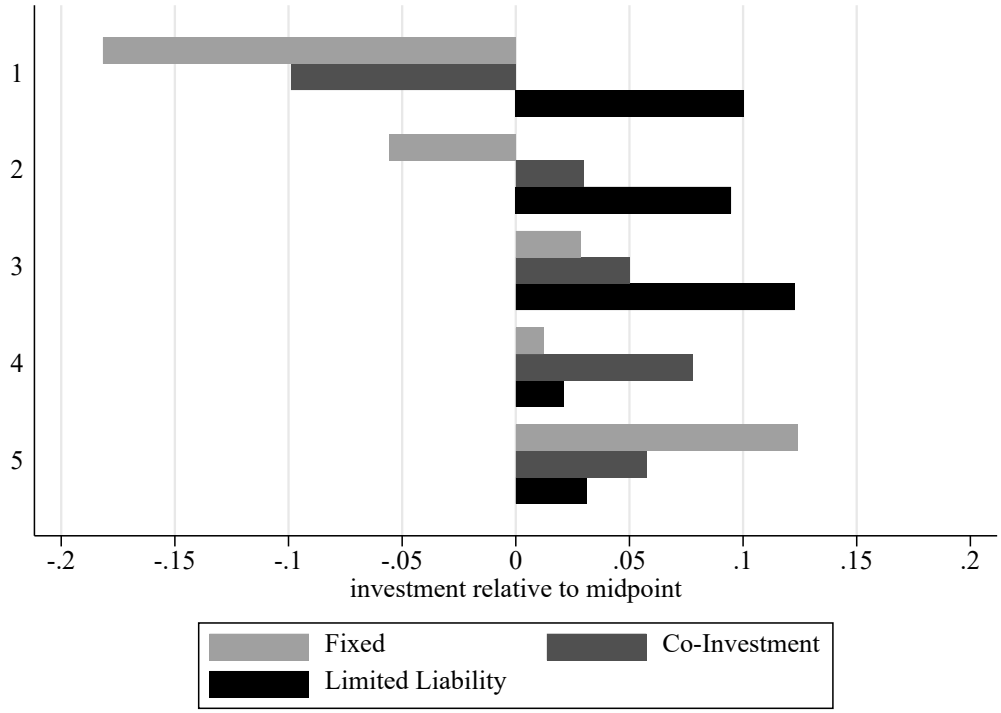
Agents' Discretion

Despite the fact that agents in our experiment strongly tailor investments to clients' preferences, they might still react to incentives in a less obvious way. Recall that agents only learn about the preferred investment profile of their clients. The profiles cover a range of admissible investment levels. Agents can follow their clients' requests and still use their discretion to their own monetary advantage by choosing investments at the upper end of the requested investment intervals. In the Co-Investment and Limited Liability treatments, this behavior would allow them to both cater to their clients' requests and maximize their own earnings potential.

To analyze whether this behavior occurs in our experiment, we first determine the midpoint of the investment interval that was requested by the client, taking the agent's perception of the investment profile as a basis. We do this for each of the agents who made an investment decision that is compatible with their client's request. Then we compare the agents' actual investments to the midpoint of these intervals. Figure 7 shows the results for each compensation treatment and for each of the five investment profiles. A value of zero corresponds to the midpoint of the interval, while values of -0.5 and 0.5 would correspond to the lower and upper boundaries of the requested interval.

There are visible differences in how agents use their discretion between the three treatment conditions. In the Fixed treatment agents seem to use their discretion to conform to the clients' requests as much as possible. For conservative requests they tend to make investments closer to the lower boundary of the interval, while for more risky requests they go beyond the midpoint of the requested interval. In the Co-Investment treatment we observe a slight shift to the right, with only one of the five requests leading to investments below the midpoint of the requested interval. The Limited Liability treatment finally reveals that agents invest in the upper half of the requested interval for all of the five possible investment requests. Relative investments are significantly higher (i.e. closer to the upper boundary) in the Limited Liability condition compared to the Fixed condition (F: 0.008 vs. LL: 0.070, $p = 0.03$, two-sided t-test). Differences between the Fixed and the Co-Investment as well as the Co-Investment and the Limited Liability conditions are not statistically significantly different (F: 0.008 vs. CI: 0.039, $p = 0.34$; CI: 0.039 vs. LL: 0.070, $p = 0.34$; both two-sided t-tests). While the effect is strongest for very conservative requests, it is somewhat smaller for investment profiles which imply a higher risk appetite. Clearly, agents in our experiment react to their own financial incentives, yet they seem to be bound by a moral obligation to their clients.

Figure 7: Agents' Discretion

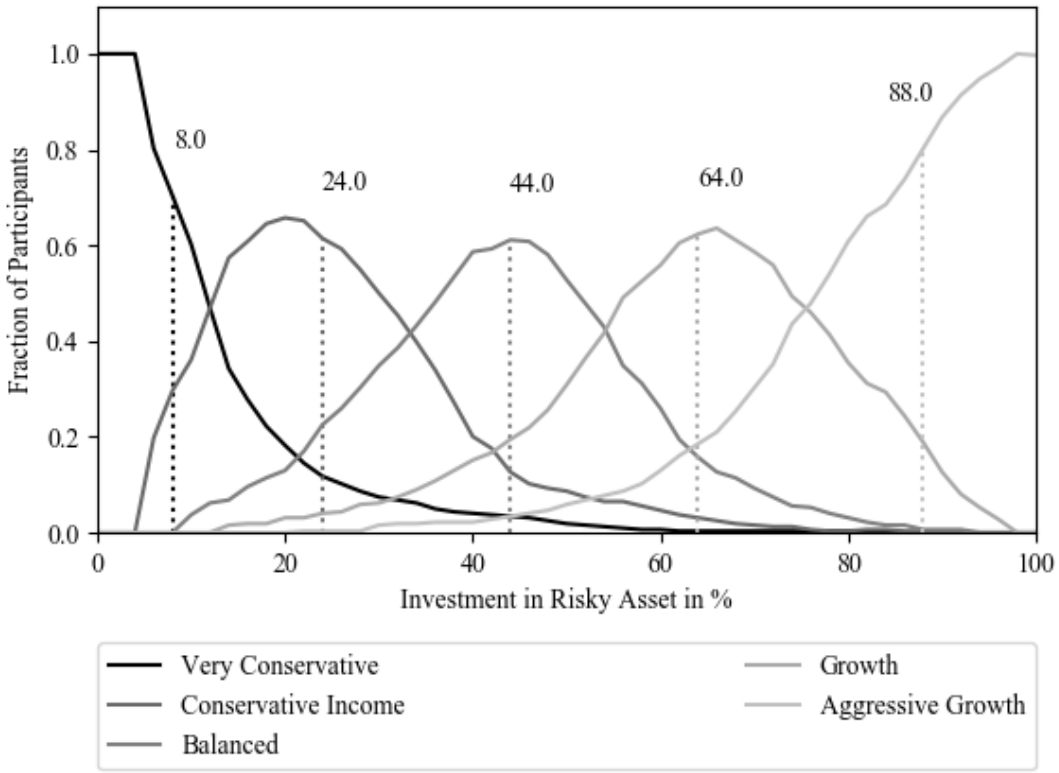


Notes: The graph shows agents' investments relative to the requested investment profile for agents who invested in line with their client's preference. Y-axis labels 1 to 5 denote the investment profiles from 1: "very conservative" to 5: "aggressive growth".

4.2 Clients' Perspective

The question of how people perceive risks has attracted much research effort. Diacon (2004) compares the perceptions of individual consumers and expert financial advisors and finds strong differences in the perception of financial risks between both groups. Slovic (1987) reports that perceptions vary between experts and lay people for physical or engineering risks and financial risks. However, this result has recently been contested by Holzmeister et al. (2019), who do not find substantial differences between financial professionals and lay people in what drives risk perception. Note, that in our experiments, all participants provide their perceptions before they even know that they will take on different roles later on. Combined with our rather homogeneous standard student sample and random treatment assignment, we can only observe heterogeneity in the perception of investment profiles but cannot study systematic differences between agent and client roles.

Figure 8: Perception of Investment Profiles



Notes: For each possible investment share in the risky asset, the graph shows the fraction of participants who mapped the respective investment profile to the investment share. The individual distributions are labeled with their medians.

Figure 8 shows the distributions of perceptions of the different investment profiles in our sample. The figure highlights a sizeable overlap of the profiles. For instance, investments in the risky asset between 30% and 60% of the endowment are perceived to match any of the available investment profiles by some participants. Consequently, there is a high degree of heterogeneity in the perception of the different investment profiles and it is far from obvious what they mean to people subjectively. Moreover, the left-shifted medians in Figure 8 provide slight evidence for risk aversion in the perception of risky investments in comparison to a uniform distribution in which each one of the categories covers 20% of the scale. Taken together, the investment profiles commonly used in financial advice appear to be very noisy in their perception, even when only considering a rather homogenous student sample.

The most interesting aspect for clients, naturally, is whether they end up with an investment level that is compatible with the preference they indicated to their agents, i.e. whether clients "get what they want". Across all treatments, this is the case for 43.8% of all clients. Table 4 breaks it down by treatment conditions. Each cell shows the percentage of clients that get what

they want. For the group treatments, clients seem to get what they prefer more often compared to the single treatments, however none of the differences are statistically significant.

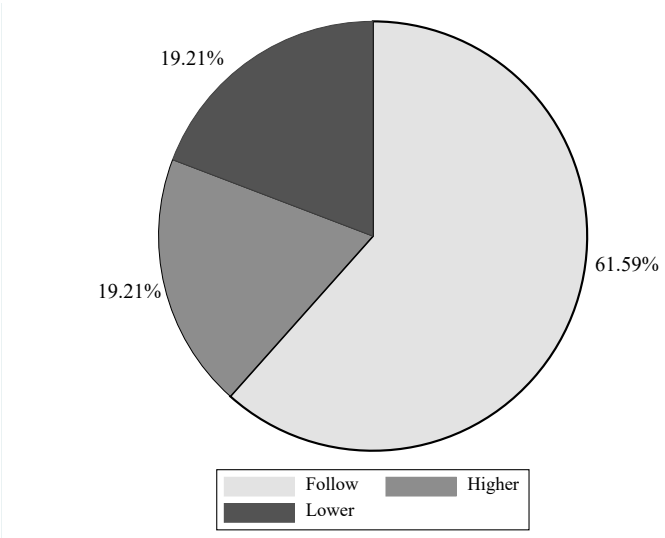
Table 4: Share of Clients Who Get What They Want

	Compensation		
	Fixed	Co-Investment	Limited Liability
Single	42.6%	42.6%	40.7%
Group	54.4%	45.6%	45.9%

Notes: The table reports the share of clients who get what they prefer according to their own perception of the investment strategies.

One might reasonably ask whether the situation remains the same if we restrict the analysis to those agents, who, according to their knowledge, did their best to implement the profiles preferred by their clients. For only 61.6% of these investments, clients perceive the investment as being compatible with their preferred investment profile. In 38.4% of the decisions in which agents try to implement their clients' preferred investment profiles, they fail to comply from their clients' point of view. With 19.2% of clients perceiving the decision being lower than preferred and 19.2% perceiving the decision as being higher than preferred there seems to be no systematic deviation, but simply a mismatch in communication on how the strategies are translated into investments in the risky asset. These results are illustrated by Figure 9.

Figure 9: Translation Error



Notes: The graph shows how clients perceive the decisions in which agents followed their preferred investment profile according to the agents' perception of the profile.

5 Discussion

Our results show that agents are generally willing to follow their clients' preferences. Even under clear monetary incentives to take larger risks, agents strongly consider their clients' preferred investment profiles. Yet, the results also provide an explanation why financial agents could be perceived to deviate from their clients' preferences. We find evidence for a fundamental problem of communication in financial advice when relying on the use of investment profile terminology. There is a large degree of heterogeneity in the perception of these profiles, which opens up the door for unintended mismatches between agents' decisions and clients' preferences. The question arises whether this translation error can be reduced by better defining the investment profiles and fostering a common understanding between agents and their clients.

To shed some light on this issue, we conducted the *Certainty* treatment, which does not leave any room for translation error by design. Disregarding agents' intentions, we find that 42.6% of the clients in this treatment get what they prefer. This is not significantly different from the 40.7% (test of proportions, $p = 0.85$) in the most comparable Single/Limited Liability treatment. In terms of the outcomes clients end up with, the Certainty treatment does not seem to make a difference. However, there are opposing effects acting behind the scenes. In our main treatment, clients may end up with an investment that is compatible with their preferences, despite the fact that their agent did not intent to implement it. This can happen by chance because of the different perceptions of the investment profiles.

Therefore, a more adequate test of the effects of Certainty is to consider only those observations from our Single/Limited Liability treatment, in which the agents' intent is to implement the clients' preferences. Limiting the analysis to these observations reveals that the possibility of translation error leads to clients getting an investment they requested in 46.2% of the cases, substantially less than the 100% in the Certainty case where agents always correctly implement if it is their intention to do so (test of proportions, $p < 0.01$). However, the Certainty treatment also shows that the absence of uncertainty about the clients' perception of the investment profiles increases the effect of incentives on agents' behavior. Investments in Certainty are higher than in the main Single/Limited Liability treatment after controlling for agents' and clients' preferences.[10] The share of agents who invest more than preferred by their

[10] We regress investment in the risky asset on a Certainty treatment indicator and agents' and clients' preferred investment profiles. The OLS coefficient estimate for the Certainty indicator is 1.19, $p < 0.05$.

clients is significantly larger than the share of agents who invest less than preferred in the Certainty treatment (test of proportions, 0.44 vs. 0.13, $p < 0.01$). This is not the case for the Single/Limited Liability treatment under uncertainty (test of proportions, 0.30 vs. 0.22, $p = 0.38$).

The consistently high degree to which agents follow their clients' preferences in our experiment is quite remarkable, yet in line with observations by Holmen et al. (2019), Ifcher and Zarghamee (2018), and Rud et al. (2018). While observing larger heterogeneity in preferences among clients (Group treatments) appears to increase differentiation as well as investment levels slightly, different incentive schemes do not have much of an effect on investment levels. We hypothesize that the accountability aspect, which is common to all of our main treatments, could be the driving force behind this result. Recall that in all treatment conditions, accountability can stem from multiple sources: First, clients tell agents how to invest for them. Second, clients can always hold their agents directly accountable for their decision by sending messages of satisfaction or dissatisfaction with the investment decisions after the fact. Finally, the clear and consistent framing of the experiment as a situation of financial decision-making might instill a heightened feeling of responsibility in agents for their clients' well-being. After all, financial decisions are often considered a matter of mutual trust. To investigate to which degree accountability affects our findings, we conduct our second, additional control treatment: *No Accountability*. As described in the design section, we remove the elements which could reasonably make agents feel accountable for their actions, yet, we do not find a significant increase in the risky investment shares (Kolmogorov-Smirnov test for the equality of distributions: $p = 0.87$; means: Single/Limited Liability: 5.09 vs. No Accountability: 5.56). It seems that agents have a feeling of responsibility for their clients, even in the absence of accountability-enhancing design aspects. Another possibility are particularly strong altruistic motives of participants in our sample. Andersson et al. (2019) find evidence for altruism to have a moderating effect on risk taking for others. Yet, in this regard we can only speculate.

Foerster et al. (2017) report that agent characteristics have a strong influence on portfolio allocations for clients. In fact, agent characteristics appear to be even more powerful in shaping portfolios than clients' preferences. While both effects persist in our highly controlled laboratory experiments, their strengths change. We find decisions for clients to be predominantly driven by client preferences and estimate agents' influences to be much weaker. One reason for this difference could be selection. Some financial institutions have been found to select their employees based on behavioral criteria associated with misconduct (Egan et al.

2019). If clients select agents based on their characteristics, or agents select their target group based on potential clients' characteristics, the strong effects observed by Foerster et al. (2017) can be expected to be dampened in our laboratory setting, which does not allow for selection in either direction.

6 Conclusion

We study four key aspects of financial agency in highly controlled laboratory experiments: Perception of investment profiles, the degree of portfolio customization, the effects of agents' preferences on clients' portfolios, and the role of monetary incentives. We observe the perception of investment profile terminology, as used in the financial industry, to be very heterogeneous, which results in considerable miscommunication between clients and their financial agents. Notably, establishing a shared understanding of investment profile terminology is not enough to significantly increase the share of clients that receive an investment that is in line with their preferences.

In general, we observe a high willingness of agents to customize portfolios to their clients' preferences. Even in light of monetary incentives to disregard their clients' wishes, agents still differentiate considerably. However, we do find a larger tendency of agents to use their discretion in choosing investment levels to their monetary advantage under limited liability incentives compared to other incentive schemes. Removing accountability aspects from the financial agency setting does not result in a significant reduction of portfolio customization in our setting. We conjecture that agents feel a moral obligation to make prudent investments for their clients in decision-making for others setting; such obligation is traded off against own interests, which may become very salient and strong in the field. Finally, portfolio customization is not free of bias: agents' own investment preferences correlate positively with the level of investments for their clients.

Our results have practical implications for settings of financial agency: In spite of the common perception that financial agents deviate from their clients' interests, we find agents to be in general willing to follow their clients' preferences. This still holds under compensation schemes which provide strong financial incentives for agents to take large risks. However, our findings also point to a fundamental problem in the communication of investment preferences. Misunderstanding between agents and clients are abundant and thus might strengthen the common perception that financial decisions taken by agents deviate from their clients' interests.

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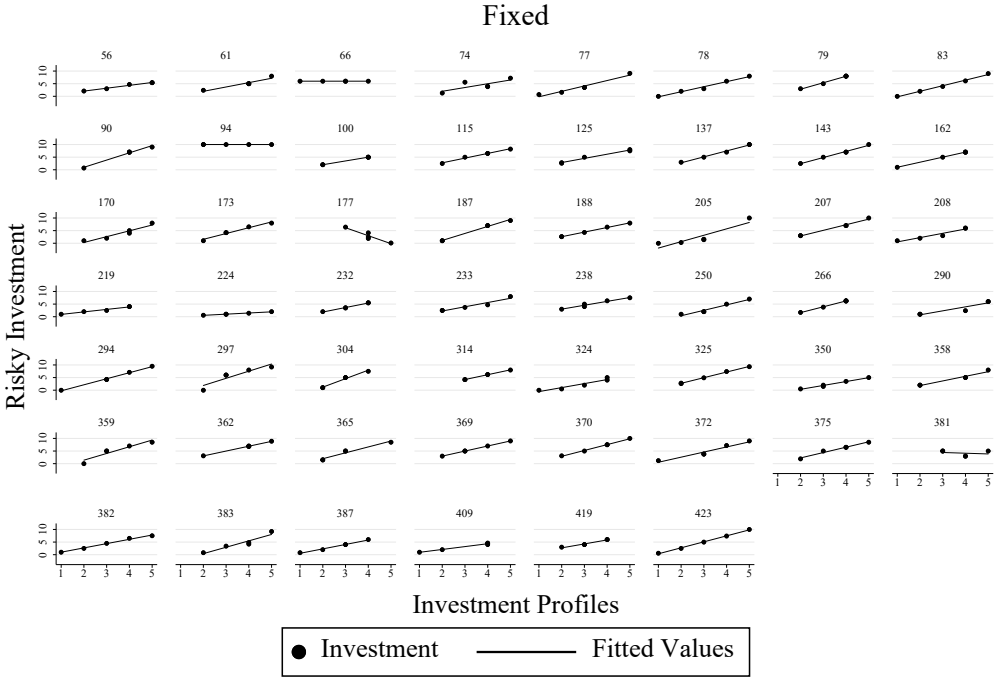
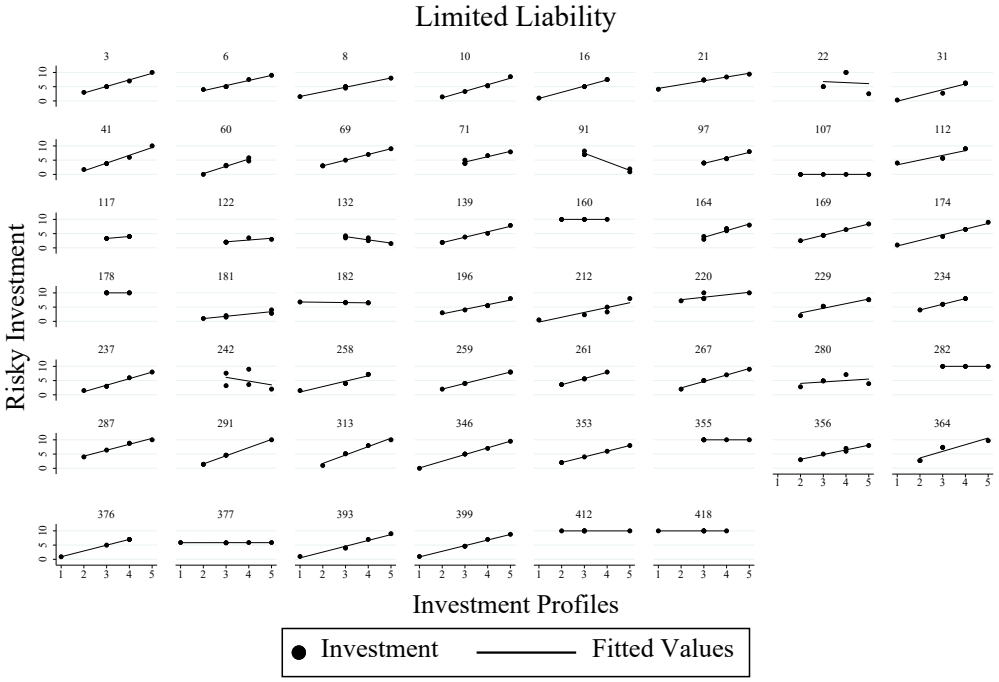
Appendix A

Figure A1: Risky Investment by Agent in Fixed treatment



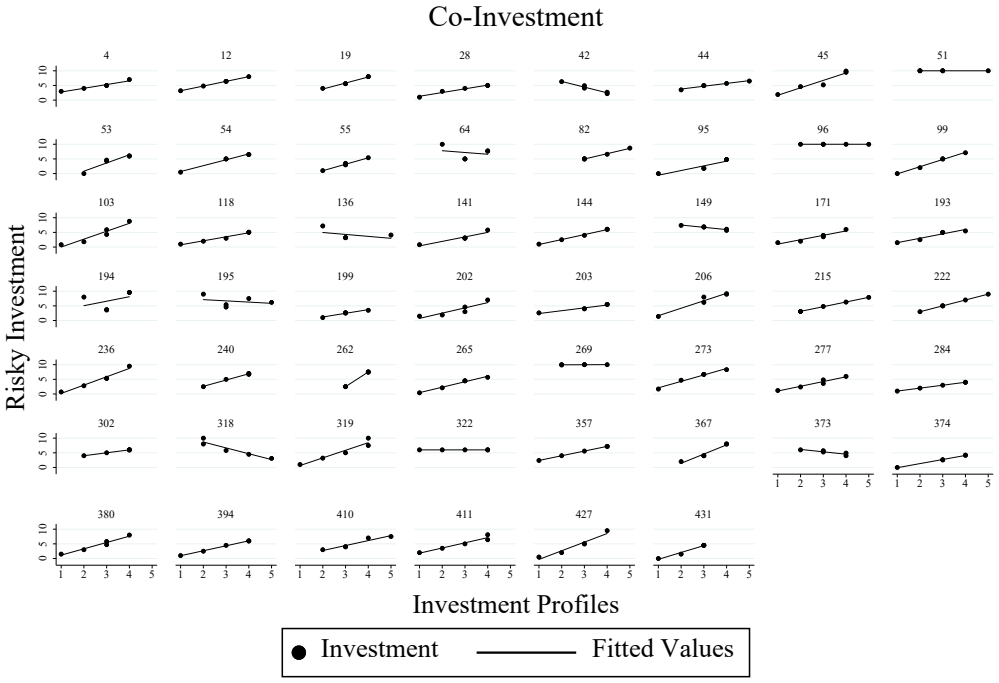
Notes: The graph shows for each participant in the Fixed/Group treatment the investment given the communicated profiles (1 = very conservative, 5 = aggressive growth) of their clients as well as the fitted values.

Figure A2: Risky investment by Agent in the limited liability treatment



Notes: The graph shows for each participant in the Limited Liability/Group treatment the investment given the communicated profiles (1 = very conservative, 5 = aggressive growth) of their clients as well as the fitted values.

Figure A3: Risky Investment by Agent in the Co-investment Treatment



Notes: The graph shows for each participant in the Co-Investment/Group treatment the investment given the communicated profiles (1 = very conservative, 5 = aggressive growth) of their clients as well as the fitted values.