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Experimenting with Financial Professionals*

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Abstract

Financial professionals play a key role in financial markets and the financial industry as a whole. Researchers in experimental economics and finance have therefore started to employ financial professionals as experimental participants. We examine this recent development in the field by reviewing 42 studies from the time period 1986–2022 which compare experimental results from samples of professionals in the finance industry to those from other samples. The considered studies cover a wide array of issues relating to the finance industry, such as risk and uncertainty, asset markets, and financial forecasting, among others. With this comprehensive review, we contribute to recent discussions about external validity and generalizability, aim to synthesize the relevant experimental results, and discuss the key methodological considerations in experimenting with financial professionals.

JEL: B40, B41, C83, C90, C93, G41
Keywords: experimental finance, experimental methodology, external validity, generalizability, finance industry

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1 Introduction

In this survey, we provide a comprehensive review of experimental economics and finance studies, which employ financial professionals as experimental participants and compare their behavior to other samples, such as students. While the early experimental literature almost exclusively investigated the behavior of students, more recent studies increasingly also consider financial professionals – as they are the ones taking the most consequential decisions on financial markets, and, more generally, to demonstrate the generalizability of experimental results. So far, we have observed mixed results in this line of research: while several studies identify differences between professionals and student subjects (e.g., Haigh & List, 2005; Alevy et al., 2007; Kaustia et al., 2008; Cohn et al., 2014; Kirchler et al., 2018), another set of studies reports no statistically significant behavioral differences (e.g., Rahwan et al., 2019; Holzmeister et al., 2020). We thus aim to synthesize this literature and identify commonalities in terms of payments, study environment, samples, or locations, that correspond to finding differences between financial professionals and other experimental participants.

Defending and endorsing laboratory studies in economics and finance, in general, one of the earliest proponents of experimental economics, Charles Plott (1982), calls such laboratory processes "[...] real [...] in the sense that real people participate for real and substantial profits and follow real rules in doing so. It is precisely because they are real that they are interesting." (p. 1486). Nevertheless, external validity is undeniably a concern with all experimental studies (e.g., Guala, 1999; Schram, 2005; Levitt & List, 2007). A key component of this issue is whether the behavior of experimental participants is representative of the behavior of people in the non-experimental, "real world" situation being modeled. This concern is even aggravated by the use of convenience samples, typically students, which are in high supply and relatively inexpensive to compensate for their participation in research studies. Plott nevertheless goes on to refute this as not being a "criticism of experimental methods [, but] a hypothesis about behavior in different subject pools". As such, it is actually "a call for more experiments (with businessmen subjects)" (p. 1522).

While initially intended as mere advocacy of economic experiments per se, this call did not remain unheard. In the following decades, researchers studying finance topics, in particular, have started to conduct experiments employing subjects with relevant task experience, i.e., individuals

working in the finance industry: financial professionals.[1] Some studies exclusively use financial professionals as participants and study their behavior in hand-picked decision situations. While these studies reveal actual behavioral patterns of trained professionals, this approach has its limits. Oftentimes it is not feasible to conduct studies exclusively with financial professionals because their supply is limited, the costs of paying them adequately are comparatively high, and access can be complicated by compliance, privacy, and scheduling conflicts. At the same time, only employing financial professionals as participants prevents researchers from understanding which findings generalize to a broader set of individuals.

The natural solution is to conduct studies involving both financial professionals and other participant samples, exposing both groups of participants to the same experimental stimuli. Such studies, which have been conducted since the late 1980s, are at the heart of this article. We review the body of experiments which involve financial professionals and – crucially – at least one additional participant sample in an attempt to synthesize the literature and thereby shed light on two fundamental questions: (1) Do financial professionals behave differently from non-professionals? (2) Does the existing literature reveal any methodological or thematic aspects that predict whether professionals and non-professionals differ in their behavior?

Our comprehensive review covers 42 studies from 1986 to 2022 and groups them into five categories based on their main topic under examination: risk and uncertainty; asset markets; forecasting; individual characteristics, culture, and context; as well as other, miscellaneous topics (see the Appendix for the complete list of included studies). We apply two inclusion criteria: first, we only include *artefactual field experiments* and *framed field experiments* but not conventional lab or natural field experiments;[2] and second, we only consider experimental studies which employ financial professionals as participants in comparison to at least one additional participant group (e.g., students or general population samples). Note that this excludes studies which employ other, non-financial professionals; studies which exclusively use financial professionals; and audit studies etc. which might employ professionals but in which subjects do not know that they are partici-

[1] Throughout this review, we use the terms "financial professionals", "finance professionals", "people in the finance industry", and "bankers" interchangeably. In all instances, we refer to all kinds of people associated with the finance industry – that is, employees and managers, self-employed traders, brokers, and other entrepreneurs in the realm of financial markets.

[2] While conventional lab experiments use a standard subject pool (students), an abstract framing, and an imposed set of rules, artefactual field experiments employ a nonstandard subject pool (such as financial professionals) and framed field experiments might apply the laboratory method to a field context. Natural field experiments, in contrast, would loosen experimental control and are conducted in a naturally occurring environment in which subjects are not aware of their participation in an experiment (see Harrison & List, 2004).

pating in an experiment.[3] Nevertheless, we include and hence, review *all* studies satisfying these simple criteria and which were indexed and accessible via Google Scholar and standard economic literature databases such as EconLit as of February 2022. Overall, we identified 42 studies published in a variety of economics, finance, accounting, psychology, and general science journals, as well as several recent working papers. Together, the studies included in this review represent a rich body of evidence on the differences and commonalities between financial professionals and other subject groups, and allow us to provide the most exhaustive review of this literature to date.

The review is organised in the following way. In a first step, we summarize the main findings for each topic and highlight differences between financial professionals and non-professionals (section 2). In a second step, we focus on the methodological aspects and how studies that reveal differences between professionals and non-professionals differ (section 3). Lastly, we discuss the overall body of evidence on financial professionals' particularities in laboratory experiments, highlight potential future directions in this line of research, and conclude. The Appendix summarizes information on the decision environments, duration, incentive structures, payments, sample sizes, and other notable aspects of each experiment covered by our review.

2 Main Findings: Are Financial Professionals Different?

In this section we summarize the main findings from the 42 surveyed studies and highlight differences between financial professionals and non-professionals across five broad topics: risk and uncertainty; asset markets; forecasting; individual characteristics, culture, and context; and miscellaneous topics. Each subsection follows the same structure. First, we first review and summarize all relevant studies. Then, in a closing paragraph, we aim to synthesize the literature and answer the overarching question of this survey, whether financial professionals are different and behave differently from a comparison group.

[3] See Fréchette (2015, 2016), for selective reviews of experimental studies with professionals as subjects with relevant task experience, more generally. Also note that we apply a comparatively narrow definition of *financial* professionals and do not include studies with "businessmen" or other professionals (e.g., we do not include the study by Burns (1985), which employs experienced "wool buyers" in an auction experiment). Füllbrunn et al. (2022) provide a recent methodological discussion of a selection of experimental studies with financial professionals including descriptive studies and studies without a comparison group.

2.1 Risk and Uncertainty

Attitudes towards risk and uncertainty are believed to be core determinants of financial decision making. Holzmeister et al. (2020) study what individuals perceive as risk using very large samples of financial professionals and laypeople. While they do not find that the two populations differ in their perception, they show that the skewness of the return distribution and the probability of suffering losses have the largest predictive power when it comes to investments in equal expected return prospects. Their results hold for different cultural backgrounds, different countries, and different job fields of professionals. In a different experimental setting focused on responses to experimentally-induced price and volatility shocks, Huber et al. (2022b) find similar results with respect to risk perception among students; financial professionals' perceived risk, on the other hand, increases as long as volatility goes up, regardless of a price change.

Moving from risk perception to actual risk preferences, we first consider contemporary studies which made use of the recent COVID-19 pandemic. On the one hand, we have Angrisani et al. (2020), who conduct risk preference elicitations of professional traders and students using the Bomb Risk Elicitation Task (BRET). They find traders to be significantly less risk averse than students in both their Pre-COVID and the COVID treatments and conclude that in the short term, the pandemic did not affect risk preferences of either group significantly. On the other hand, we have Huber et al. (2021) who conduct a similar study with an investment task constructed from historical stock index patterns. They compare investments between financial professionals and students before and during the COVID-pandemic (202 / 113 professionals, 282 / 216 students (before / during)). For both treatments they find that financial professionals invest more than students (own calculations: wave 1: 76.94% vs. 57.47%, $p < 0.0001$; wave 2: 68.02% vs. 55.99%, $p < 0.001$, two-sided t-tests). However, while the level of investments is hardly affected by the pandemic for students, the investments of financial professionals are reduced significantly. While the effect of the pandemic on risk-taking seems to be inconclusive so far, both studies have reported financial professionals to take more risk (pre-pandemic) than students. In the related study mentioned above, Huber et al. (2022b) also report more pronounced responses to experimentally-induced price and volatility shocks by financial professionals in comparison to a student sample. In particular, professionals decrease their investments in a risky asset after price surge and increase their investments after a price drop. Overall, professionals' investment levels are significantly lower than those of students.

Similar patterns can also be observed in Haigh & List (2005), who test whether students and professional traders exhibit Myopic Loss Aversion (MLA) to a similar degree using the investment task of Gneezy & Potters (1997). They find that MLA is significantly more pronounced among traders than among students. While not at the core of their study, their results nevertheless also reveals that in the control condition, in which participants face the same investment decision over the course of nine rounds and receive frequent feedback, students invest significantly ($p < 0.05$) less in the risky asset than professionals.

Kirchler et al. (2018) study the effects of rank and tournament incentives on financial professionals and students in an investment task over multiple rounds. Their data allows us to directly compare the investment behavior of student participants and financial professionals. Supporting the findings of the previously mentioned studies, on average students are found to invest significantly less in a risky asset than financial professionals. With regard to the paper's main research question, the authors report that financial professionals care about relative performance and that tournament incentives increase risk taking, but do not affect the rank-dependent investment behavior. Students on the other hand only react to ranking incentives if they come with monetary consequences.

Gajewski et al. (2020) directly study whether risk preferences of wealth advisors differ from those of students in laboratory and online experiments. They use the method of Tanaka et al. (2010) to estimate risk aversion, probability weighting, and loss aversion from three choice lists. While they do not find significant differences in risk aversion, the participants' choices reveal a gender-dependence in loss aversion. Female wealth advisors are found to be less loss averse than their student counterparts (lab: $p = 0.073$, online: $p = 0.027$), while no statistically significant differences appear for males when controlling for demographic characteristics. A major caveat for this result is the low number of only eleven female wealth advisors included in the study.

Stefan et al. (2022) include self-reported measures of risk tolerance for a sample of the Swedish general population and financial professionals. The Likert-type measures reveal less risk aversion among the professionals than the general population sample for both aspects: risk-taking in general and risk-taking in financial matters. In addition, the authors use the investment task of Banks et al. (2019) to measure decision-making quality. Their data reveals that risk averse financial professionals do not make better portfolio choices than risk averse members of the general population. However, among the more risk tolerant, financial professionals exhibit higher decision-making quality in constructing their portfolios.

So far, we have presented studies that directly speak to the differences in risk preferences between financial professionals and non-professionals. Yet, the literature has studied a much broader set of issues in the context of risk and uncertainty. There are two studies, in particular, that put the focus on risk-tolerance assessments. Roszkowski & Grable (2005) study whether financial advisors and their clients differ in their ability to correctly estimate their own risk tolerance. Based on responses to a developmental version of the Survey of Financial Risk Tolerance (SOFRT), the authors conclude that clients are statistically significantly better at assessing their own risk preferences than financial advisors. In addition, they report that financial advisors show a greater risk tolerance than their clients, which is in line with much of the previously presented literature.

Similarly, Roth & Voskort (2014) study how financial agents gauge the risk preferences of their clients. Students as well as junior and senior financial professionals are asked to predict two risk preference measures (a multiple price list following Holt & Laury (2002) and an investment question included in the Socio-Economic Panel SOEP) from a list of demographic characteristics and a self-reported risk preference of their clients. Senior professionals exhibit a statistically significantly stronger false consensus effect than junior professionals and non-professionals. That is, their own risk preferences correlate more strongly with their predictions for their clients than those of junior professionals and non-professionals. Junior and senior professionals are both found to be more accurate in predicting risk preferences than students.

A further branch of the literature is concerned with different biases and behavioral phenomena that affect decision making of professionals and non-professionals in decisions involving uncertainty. As a first entry in this category, List et al. (2005) let CBOT traders and undergraduate students make choices in the classic Allais paradox situation to test expected utility theory. The authors report both students and traders to exhibit choice patterns that are in line with the Allais paradox. While not formally tested, the patterns also suggest that traders are somewhat less likely to make choices in line with the paradox. While the students do not seem to reduce compound lotteries to simple lotteries, the authors cannot reject the hypothesis that traders do.

Second, List & Haigh (2010) pit the options model against the neoclassical investment model. They find that the decisions of both CBOT traders as well as undergraduate students are more in line with the options model than the classical model and that both groups seem to follow the "bad news principle" (Bernanke, 1983), i.e., taking only the expected severity of future bad news into account in deciding whether to invest in an asset today. The authors highlight that traders seem to be less responsive to payoff changes than students.

Gilad & Kliger (2008) conduct an experiment with investment advisors and undergraduates studying economics. They prime their participants with stories that are supposed to either induce risk-seeking or risk-averse behavior and elicit certainty equivalents for binomial lotteries based on stock returns. They find that both financial professionals and students are affected by the priming manipulation. Participants primed with the risk seeking story behave less risk averse than those primed with the risk averse story. Notably, professionals are reported to react stronger to the priming than students.

Razen et al. (2020) run lab-in-the-field experiments with financial professionals and participants from the general population targeted at measuring domain-dependent risk-taking. That is, they ask whether behavior in non-financial and financial decision contexts is the same for both financial professionals and non-professionals. For non-financial decision contexts, they find that both professionals and non-professionals are affected by the outcome domain, i.e. the framing of outcomes as gains or losses. Both samples show a higher tendency to take the risky choice option in the loss domain than in the gain domain. For explicitly financial decision contexts, their professionals behave differently from their non-professional participants. For professionals they find behavior to be in line with the disposition effect (they are less likely to hold on to a winning stock than a losing stock), but they do not find this effect for non-professionals. Both samples are found to be similarly affected by the narrow framing bias.

Finally, Hanaki (2022) presents an incentivized experimental test of Kunz et al. (2017). His experiment demonstrates that students perceive Barrier Reverse Convertibles – a common type of structured financial products – to become less risky when a comparatively safe asset is added to the basket of underlying assets when in fact it becomes more risky. Financial professionals do not make the same mistake. While the pattern of probability misperceptions among students is reminiscent of the "dieter's paradox" (Chernev, 2011), more financially sophisticated professionals do not appear to be similarly affected.

SUMMARY. A fairly persistent finding in experimental studies about risk and uncertainty is that financial professionals show less risk aversion than non-professionals. At the same time, the two samples seem to differ in their susceptibility to psychological phenomena such as context-dependent framing, priming, and differing perceptions of outcome domains. However, in this regard, the evidence is less conclusive because the individual pieces of evidence largely stem from single studies that do not explicitly or implicitly replicate previous findings, which would allow for an accu-

mulation of results over time. We refer to section A.1 of the Appendix for further details on all studies.

2.2 Asset Markets

One of the most prominent lines of research within the field of experimental finance is the work on experimental asset markets, originating in early studies by Smith (1962), Forsythe et al. (1982), Friedman et al. (1984), and Plott & Sunder (1982, 1988), among others – all looking into different aspects of asset pricing applying the laboratory method with student participants. One particular study, Smith, Suchanek, & Williams (1988), proved pioneering in examining the foundations of bubbles and crashes in experimental asset markets, and their so-called "SSW" design became the leading paradigm in this line of research (see Palan, 2013, for a comprehensive review). With standard student participants, they report that price bubbles and crashes tend to form in long-lived markets, i.e. when an asset lives for multiple consecutive trading periods, where each asset pays a risky dividend at the end of each period: in a vast majority of sessions, inexperienced subjects trade assets at prices considerably above their fundamental value. To counter the argument that their results might be "an artifact of student subjects, and that businessmen who 'run the real world' would quickly learn to have rational expectations", they run one experimental session employing "professional and business people from the Tucson community" (p. 1130). While they indeed find no more rational behavior (i.e., not more efficient prices) and even larger deviations from fundamentals than in the students sessions, this early result can only be regarded as anecdotal evidence for it only comprises one independent observation and it is not clear whether the sample consists of finance professionals, in particular.

In a series of experiments, King et al. (1993) extend Smith et al. (1988) and test the robustness of their results against several modifications. Besides introducing "experienced" student subjects to the experiment (i.e., subjects participated in the same experiment once or twice more), one of these modification is the inclusion of "experienced business persons," in contrast to inexperienced students as experimental participants. They conducted one session exclusively with corporate executives from different industries, as well as one session with six over-the-counter traders and three experimenters as "insiders." While King et al. (1993) reports somewhat smaller or no bubbles with once- and twice-experienced student subjects, they still find considerable overpricing with professionals, i.e., with corporate executives or traders who are first-time participants in

the laboratory experiment. Hence, they conclude that professionals show indeed similar, general patterns to inexperienced students – that is, bubbles do not disappear.

DeJong et al. (1988) run one sealed offer laboratory market experiment each with standard student subjects as well as with what they call "businessmen subjects," who include accounting firm partners and corporate financial officers. Their experiment is based on DeJong et al. (1985) and examines the price and quality choices in a principle-agent framework. Students were incentivized by monetary payouts, whereas professionals had the possibility to win a university souvenir if they manage to outperform their student counterpart in the experiment (i.e., the corresponding student subject in the same role and with the same endowment). They observe very similar results for businessmen and for students along three different performance measures (average prices, sellers' expected profits, and market efficiencies) and find no statistically significant differences between the two groups of participants.

In examining whether individual ambiguity aversion persists with trading in experimental markets, Sarin & Weber (1993) conduct two of their 14 experimental sessions with bank executives described as "bond or currency traders or advisors" with "a minimum of two years of work experience" (p. 604). Albeit only considering two market sessions, the authors report no differences in behavior compared to markets populated by students: with both subject groups, an ambiguous asset tends to yield lower prices than an unambiguous (risky) asset.

Anderson & Sunder (1995) compare students' and professionals' market outcomes and behavior in double oral auction experiments. More particularly, they analyze how well market outcomes approximate equilibrium predictions and whether experience is conducive to alleviating the level of bias which market participants exhibit in the experiment. Overall, they find that participants' prior market experience matters for price and allocation outcomes as students' behavior tends to be best predicted by a representativeness model, while prices in professionals' markets can be better approximated by a Bayesian model. Moreover, experienced professionals exhibit a considerably reduced price bias, which tends to decrease over time. Nevertheless, Anderson & Sunder (1995) conclude that the exposure to market forces which professionals clearly experienced, "does not appear to be sufficient ... to eliminate bias." (p. 196).

A similar conclusion, albeit in a different experimental set-up, is provided in the study by Weitzel et al. (2020). Weitzel et al. (2020) run a series of lab and lab-in-the-field experiments comparing market efficiency and the emergence of bubbles across several treatments. Incorporating previous results on student samples, they conduct two treatments with market characteristics previously

shown to be conducive to mis- and overpricing, as well as two treatments which tend to produce comparatively efficient prices. Overall, markets with professionals exhibited less overpricing as well as fewer and smaller bubbles – prices were, on average, more efficient. Yet, looking into treatment differences within each group of subjects, Weitzel et al. (2020) report qualitatively similar patterns for students and for finance professionals: bubbles did arise even in markets populated by professionals, and the treatment differences – that is, significantly more efficient prices with a constrained cash-to-asset ratio or with short selling, and significantly less efficient prices with a comparatively high supply of cash – held for both subject pools. In a series of additional tasks, they find hardly any significant differences between students and professionals with regard to their cognitive skills. Moreover, professionals reported a higher willingness to take financial risk than students, but showed no differences in their general risk attitudes. Weitzel et al. (2020) suggest that the higher level of price efficiency with professionals could be a result of their real-world market experience and their experience with price dynamics, financial investments, and trading, more generally.

In a closely related study, Cipriani et al. (2020) contrast students and professionals traders in three experiments relating to financial markets: an SSW-type market experiment, a guessing game (Nagel, 1995), and an individual-decision variation of the guessing game. Their results confirm that finance professionals and traders, in particular, trade at prices close to fundamentals and thus foster market efficiency. Nevertheless, a classic bubble-crash pattern did emerge in one out of seven professionals markets, demonstrating that markets can be inefficient and overpriced even with professionals traders. Similarly, the guessing game reveals that professionals behave more in line with the Nash Equilibrium than students. Corroborating the results by Weitzel et al. (2020), conducting a number of side tasks, Cipriani et al. (2020) observe that the differences between professional traders' and students' behavior in the market experiment and the guessing game do not arise from the former's superior cognitive abilities, a higher level of overconfidence, or a difference in risk attitudes.

SUMMARY. While the early studies of professionals in experimental asset markets are subject to rather vague definitions of "financial professionals" and small sample sizes, whereby they might be under-powered, by now the literature paints a convincing picture: financial professionals and traders, in particular, tend to produce more efficient prices than student subjects. Note that without any exception, all studies looking into this question also find that bubbles and market inefficiencies can and do arise even with an experienced subject pool such as financial professionals. Being an

experienced professional in the finance industry surely helps, but alone, it is not sufficient to eliminate being susceptible to biases and other commonly observed treatment effects, such as overpricing in a high-liquidity environment. Details on the design of the studies covered in this section are presented in section A.2 of the Appendix.

2.3 Forecasting

An important aspect in all financial markets' are beliefs, i.e., market participants' forecasts of future asset prices, as they relate to trading behavior (e.g., Hong & Stein, 2007; Carlé et al., 2019). In the asset market experiments with financial professionals discussed above, heterogeneous beliefs among students and professionals foster market inefficiencies; likewise, professionals' and students' beliefs in those markets similarly relate to the respective group's trading behavior (Füllbrunn et al., 2022). However, when it comes to forecasting naturally occurring asset prices, the first question one might ask is whether professionals – with their experiences and exposure to financial markets – are actually better forecasters than laypeople and students.

In this regard, Muradoğlu & Önkal (1994) elicit probabilistic stock price forecasts for 34 domestically listed companies across several time horizons from portfolio managers working for a bank-affiliated brokerage house ("experts") and from what they call "semi-experts," i.e., internal auditors and managers who completed a training program on portfolio management. In comparing the actual portfolio managers' and the semi-experts' performance, they find the experts' calibration to be significantly better across all performance measures in short-term forecasts (one-week horizon). For a longer horizon (four weeks), however, semi-experts tend to be better calibrated. For the most part, this "inverse expertise effect" has, however, not been found in a related study by Önkal & Muradoğlu (1996), in which they similarly compare probabilistic forecasts for 34 companies from "experts," "semi-experts," and student subjects as "'novices" across two different forecasting task formats.

These early studies on forecasting abilities suggest that finance professionals are indeed better forecasters in some contexts, but can be even more biased than some control group in other contexts. A more recent study by Bao et al. (2022) corroborates these results in a systematic fashion. They compare financial professionals' and students' forecasting performance across four incentivized lab and field tasks. In the most abstract forecasting task, they find no performance differences. Counterintuitively, however, in more realistic lab and field tasks, they find differences but professionals do not necessarily outperform students. In forecasting a historical time series,

the S&P500 stock index, without information on the stock's/index's name and the selected time period, students actually outperformed professionals. In forecasting the Nikkei index, however, – a field task in which expertise and better access to information might give professionals an advantage – financial professionals indeed have the upper hand.

Building on her earlier work, Muradoğlu (2002) also raises the important question to what extent financial professionals' forecast errors are systematic, predictable, by experimentally comparing their stock market forecasts to those from business students. Overall, she finds prevalent optimism in real-time stock market forecasting when the stock's name is known; however, finance professionals in her sample are generally even more optimistic than the student novices. Looking into price forecasts and investor satisfaction in a sample of 150 finance professionals and 576 students, Schwaiger et al. (2020) find that professionals and students show very similar patterns across different price paths, for which they compare positive and negative final returns and vary how they are achieved (i.e., an upswing followed by a downswing and vice versa). The authors report professionals' expectations to be less prone to framing effects than students' ones and do not find professionals to be more optimistic than a non-financial control group.

As a related concept, several studies have shown that finance professionals are not just over-optimistic about potential stock returns, but also tend to be overconfident with regard to their own forecasting ability. In two studies with 43 stock market professionals and 63 laypeople (i.e., students), Törngren & Montgomery (2004) find that professionals' errors in forecasting are similarly-sized than those by laypeople, but professionals are worse calibrated – i.e., they erroneously expect their own forecasts to be more accurate; thus, they are more overconfident than laypeople. Similarly, in a sample of 29 professionals of a large German bank and 64 finance students, Glaser et al. (2007) find professionals to be more overconfident than students in trend prediction tasks abstracted from specific stock markets. Comparing financial analysts' and laypeople's financial forecasts during the financial crisis of 2009/2010, Zaleskiewicz (2011) find that experts are only slightly more accurate in their stock forecasts but not in exchange rate forecasts, whereas they are more confident about their forecasts in both markets. Corroborating these earlier results with a large sample of 369 and 1224 U.K and U.S. participants from the finance industry and the general population, respectively, Huber et al. (2019) report widespread miscalibration and overconfidence among all subject groups across several stock market forecasting tasks: they vastly underestimate stock market volatility, set the respective confidence intervals for their point predictions too narrowly, and wrongly expect smaller forecast errors for their own (i.e., professionals') forecasts. In

addition, Huber et al. (2019) find that finance professionals are less influenced in their forecasting by "social information", i.e., by being presented with other people's forecasts, than laypeople.

The "social information" shown to participants in Huber et al. (2019) essentially operates as an "anchor"; an initial benchmark or starting value, often irrelevant, which has been shown to alter numerical estimates (Tversky & Kahneman, 1974). In a series of experiments, Kaustia et al. (2008) specifically examine the responsiveness of finance professionals and a control group of students to different "anchors" in stock market forecasting. Overall, they find professionals' long-term stock return expectations to be influenced by anchors to a smaller degree than students'. Yet, finance professionals are not immune to and still affected by such anchors.

Recently, Barron et al. (2021) corroborate previous results that individual professional investors from various financial institutions are not necessarily better than forecasters than non-professional investors from different (non-financial) industries. However, at the group-level, mean forecasts of professionals are indeed better as their individual errors are less correlated than in the control group of non-professionals.

SUMMARY. So far, it seems that in most contexts – even in those relating to financial markets – financial professionals are, overall, neither better nor worse forecasters than students or laypeople. While some earlier studies have found professionals to outperform others in forecasting stock market prices, these results seem to be sensitive to the particular asset class (and potentially different familiarity thereof), time horizon, or context, and could not be reinforced in later studies. Also note that the earlier studies have vastly smaller sample sizes and several other differences in their experimental design: they were mostly take-home surveys conducted over several days, while later ones were conducted either online or in person within only a few minutes; only the forecasting studies since Kaustia et al. (2008) were incentivized, that is, more accurate forecasts resulted in higher monetary payouts. Nevertheless, the recent study by Bao et al. (2022) reinforces the view that forecasting performance is context-dependent as professionals outperform students in a field task. They argue that financial professionals' expertise might have been underestimated in previous works that focused on lab tasks. On top of that, one fairly robust finding across most studies is that financial professionals tend to be more optimistic and overconfident in their probabilistic forecasts than other subject groups. Details for the respective studies can be found in section A.3 of the Appendix.

2.4 Individual Characteristics, Culture, and Context

Besides potential differences between finance professionals and laypeople with regard to the core themes in finance discussed above – decisions under risk and uncertainty, asset markets and pricing, forecasting – a more recent development is researchers increasingly being interested in other aspects constituting the financial industry profession, namely, finance professionals' individual characteristics as well as the identification and potential effects of a prevalent "business culture".

In a prominent study, Cohn et al. (2014) experimentally examine the role of such a prevailing business culture within the finance industry on (dis)honest behavior using a coin tossing task, in which participants anonymously report the outcome of ten coin tosses and are compensated depending on the outcomes of the coin tosses – leaving the possibility to misreport the coin toss for one's monetary benefit. Bank employees from a large, international bank, half of whom work as private bankers, asset managers, traders or investment managers, participated in this study. As a control group, the authors employ workers from outside the banking industry as well as university students. In the treatment condition, bankers were primed by being asked several questions about their professional background to render their professional identity salient, whereas in the control condition they were asked questions unrelated to their profession. With 58.2% reportedly successful coin flips, participants from the finance industry who were primed with their professional identity behaved significantly less honestly than bankers in the control condition (51.6% successful coin flips reported). For non-banking employees and students, however, the treatment variation had no significant effect on (dis)honest behavior, whereas students were not significantly more honest than bankers.

In a large-scale replication attempt, Rahwan et al. (2019) follows up on these initial results and conduct a series of experiments with bankers and non-bankers from five different populations across three continents, all applying the same task as in Cohn et al. (2014): they employ commercial bankers from two institutions in the Asia Pacific region and professionals at a medium-sized bank in the Middle East (as well as non-bank employees from these two regions as well as from Europe). Overall, they do find dishonesty among finance professionals, but cannot replicate the original result of a significant effect of priming bankers' professional identity on subsequent dishonesty – calling into question its generalizability beyond the originally sampled population.

In a closely related study, Huber & Huber (2020) examine finance professionals' (dis)honest behavior from a different perspective: with a sample of professionals and a control group of students,

they vary the situational context of a controlled, experimental cheating task across several treatments. As different situations can evoke different social norms (e.g., Akerlof & Kranton, 2005), financial decision-situations might lead to different levels of honesty than decisions in non-financial situations, for financial professionals in particular. Indeed, Huber & Huber (2020) find that a financial context framing makes professionals significantly more honest compared to neutral and abstract situations, while students do not react to the framing. Moreover, Huber & Huber (2020) identify social norms and reputational concerns, in particular, as the drivers for these behavioral differences. On average, finance professionals behave even more honestly than students in two out of three treatments.

Developing this idea of a prevailing business culture particular to the finance industry, which comes with social norms and informal rules on top of its legal and institutional framework, further, Cohn et al. (2017) analyze whether priming bankers on their professional identity affects their risk attitude in an experimental investment task. They apply the same priming method as in Cohn et al. (2014) with a sample of employees of a large international bank and non-banking employees. In contrast to the common expectation that professional norms in the finance industry would foster excessive risk-taking, they find bankers to take significantly less risk in the priming condition. In additional experiments, Cohn et al. (2017) replicate their initial results with 142 bankers from several other, smaller and larger banks, but do not find this effect among their sample of non-bankers.

Extending the earlier work discussed above, Lindner et al. (2021) examine how social motives such as reputational concerns and intrinsic (self-image) motivations affect risk-taking in decision-situations involving relative performance comparisons by running lab and lab-in-the-field experiments with students and finance professionals. Their results show that both samples try to compensate payoff underperformance. In doing so, however, professionals' behavior is to a large extent driven by intrinsic motives, with reputation playing only a minor role. For students, in contrast, social image and reputational motives, which are experimentally induced by publicly announcing "winners" or "losers", tend to be a key determinant in their risk-taking behavior.

In a recent contribution, Holmen et al. (2021) aim to provide a comprehensive analysis of finance professionals' economic preferences and personality traits in comparison to a general population sample. In an online study with professionals working as financial analysts, financial advisers, traders, fund managers, and financial brokers, and with people from the general population, – both samples from the Swedish population – they conduct a series of experimental tasks elicit-

ing their attitudes towards risk, losses, and skewness; their distributional (social) preferences; their trust and trustworthiness; their (dis)honesty behavior; as well as their personality traits. A key aspect of this study is that the experimental data has been merged with registry data on socio-economic characteristics provided by Statistics Sweden, allowing the authors to estimate the difference between finance professionals and the general population sample controlled for the variation in these variables. The authors report financial professionals to be more risk tolerant, more selfish, less trustworthy[4], and that they show higher levels of narcissism, psychopathy, and Machiavellianism. After adjusting for the available socio-demographic background variables, however, many of the reported effects disappear or are considerably deflated. Nevertheless, Holmen et al. (2021) observe professionals to be less risk averse, less trustworthy, more competitive, and slightly more psychopathic then a general population sample, even after controlling for their socio-economic background.

With regard to finance professionals' psychological profile, Noll et al. (2012) also compared the behavior of professional traders from mostly large international or medium-sized banks with the behavior of psychopaths (inpatients from two German high-security psychiatric hospitals) and people from the German general population taken from Mokros et al. (2008) in an identical prisoner's dilemma game. They find that finance professionals make more uncooperative decisions than both psychopaths and people from the general population, and interestingly, they maximized the difference between their own and their respective partner's profit without necessarily optimizing their own total profit. In addition, Noll et al.'s results suggest professionals' psychological profiles to be closer to laymen than psychopaths' ones.

SUMMARY. With the exception of Cohn et al. (2014) and the last two mentioned in this section, all of the considered studies have only been published in the last five years. Hence, they meet one's expectation of containing comparatively large sample sizes and a broad spectrum of financial professionals. Some answers to the question of whether bankers and financial professionals differ in their individual characteristics and have a common (business) culture remain inconclusive, nevertheless. Several differences identified as particular to the finance industry in earlier studies subside after controlling for socio-economic characteristics; the effect of a banking culture fostering dishonesty could not be replicated. What remains as distinguishing characteristics of

[4]This is also supported by the results of Gill et al. (2022), who find that university students aspiring to work in the financial industry are less trustworthy than students aiming for non-finance careers. In addition, students who actually enter the finance industry are less trustworthy than students entering other industries.

financial professionals, nevertheless, is less trustworthiness, more competitiveness, and a higher propensity for psychopathy. Study details are provided in section A.4 of the Appendix.

2.5 Miscellaneous

Behavioral differences between financial professionals and non-professionals have been studied in a variety of further contexts, including auditing, arbitrage exploitation, and information processing. Frederick & Libby (1986) have experienced auditors and students make predictions about how weaknesses in companies' internal control processes translate into errors in financial statements. Their experimental setting is an adaptation of Tversky & Kahneman's (1983) scenarios to the audit context. In line with their predictions, the authors find that experienced auditors have acquired knowledge that sets them apart from students when assessing the probabilities of errors occurring jointly rather than separately.

Abbink & Rockenbach (2006) experimentally investigate option pricing by professional traders and students building upon the option-pricing model of Cox et al. (1979). They find that for economics students trained in mathematical methods the estimated separating price, i.e. the price which separates the decision to buy an option from selling it, depends on the probability of the underlying stock moving in price. Professionals do not exhibit this pattern. Their behavior is more in line with the theoretical prediction of the option-pricing model, which states that the probability of the underlying asset moving should not affect the price of the option. At the same time, professionals are found to engage less in exploitation of arbitrage opportunities and achieve lower expected payoff efficiency than the students. The gap between students and professionals closes when students with a non-technical background and without formal training in option pricing are included in the study.

Alevy et al. (2007) conduct a field experiment on information cascades with financial market professionals (CBOT) and students. They find the professionals to rely more heavily on their private information and on the quality of the publicly available signal than students. Therefore, students, despite being more in line with Bayesian reasoning, do not outperform professionals market professionals in earnings. While students appear to be differently affected by gains and losses, no such domain-dependence is evident from the professionals' behavior.

In a lab-in-the field experiment on the impact of environmental externalities on portfolio decisions with financial professionals and students, Duchêne et al. (2022) find professionals to be more

pro-environmental than students. Nevertheless, unlike for students, for professionals such pro-environmental (as well as pro-social) preferences cannot explain their portfolio decisions. Details on these studies are provided in section A.5 of the Appendix.

3 Methodological Aspects

3.1 Sample definition and characteristics

Several studies restrict their recruitment of professionals only to a limited extent and employ a relatively broad definition of financial professionals of multiple career stages and specializations (e.g., Törngren & Montgomery, 2004; Glaser et al., 2007; Huber et al., 2019; Holzmeister et al., 2020; Rahwan et al., 2019). In these kinds of studies, "Financial professionals" appears to be used mainly as an umbrella term to describe members of the general working population that are employed in the finance industry. While the general idea of conducting finance experiments with finance professionals as participants is to examine the behavior of actual protagonists in financial markets, this broad definition not only covers a variety of different types of financial institutions (e.g., small, locally-operating commercial banks and large, internationally-operating investment banks), but crucially also a multitude of job descriptions and business divisions. A common concern is that bank tellers, loan officers, fund managers, and executives, for example, are too different from each other to be treated as a homogeneous sample. Moreover, these different groups of finance professionals might also, naturally, exhibit differential expertise necessary for particular tasks relating to the experimental setup.

Catering to concerns about external validity, experimental participants should be "representative" of the relevant decision-makers in naturally occurring situations. As such, it depends on the particular research question and experimental set-up, what type of finance professionals are appropriate participants that can generate results that generalize. A number of studies take this approach and more strongly focus on "high-skilled" employees from core finance units as the relevant agents to address their research question and to account for the complexity of the decision task, utilizing their greater experience in financial markets (e.g., Alevy et al., 2007; Cohn et al., 2014, 2017; Kaustia et al., 2008; Kirchler et al., 2018; Holmen et al., 2021; Weitzel et al., 2020). In fact, there are only very few examples of studies, which exclusively employ one particular type of financial professionals (List & Haigh, 2010, for example, specifically recruit commodity and options traders).

3.2 Recruitment and selection

A question closely connected to the definition of financial professionals is the issue of recruitment and selection as getting financial professionals to participate in studies is not an easy task. Besides the obvious challenge of getting access to a pool of potential participants in the first place, company policies, compliance considerations, and data protection laws might increase the barrier to this kind of research. Researchers have met these challenges in different ways: Some have recruited their participants at seminars, workshops, conferences and trade fairs attended by finance professionals (e.g., Kaustia et al., 2008). Some were successful in fostering connections to financial institutions to recruit their employees as participants and have also started to build their own proprietary databases of participants (e.g., Weitzel et al., 2020). Another approach has been to recruit professionals via market research companies who maintain large international samples (e.g., Huber et al., 2019; Holzmeister et al., 2020; Kirchler et al., 2020), or via a government agency with access to people's employment information (Holmen et al., 2021; Holzmeister et al., 2022; Stefan et al., 2022). Recently, online labor markets such as Amazon MTurk or Prolific have added options to filter potential participants by profession and job description, giving a much larger group of researchers access to self-declared financial professionals as participants for their studies (e.g., Angrisani et al., 2020; Huber & Huber, 2020).

The way of recruitment largely determines the particular group of financial professionals researchers are able to target (see section 3.1), but also comes with potential selection issues. Close connections to financial institutions, for example, make it easier to recruit selected sub-samples of professionals that fit the study at hand. Yet, researchers lack control over whether participants are strictly participating voluntarily (one could imagine cases where invitations are circulated from their respective higher-ups). Proprietary participant pools may appear like black boxes, requiring the reader to trust that the pool contains the professionals that it claims to. At the same time, the possibility to contact professionals directly avoids having to go through and disrupt the business operations of financial institutions for future experiments. It might also make it easier to have professionals from multiple institutions partake in the same experiments, reducing concerns about institution-specific effects and selection bias. Turning to online labor markets has the advantage of gaining access to potentially much larger sample sizes than would be possible through other means. Of course, this comes at the cost of control, as researchers and readers alike face the issue of not knowing exactly who the self-reported financial professionals on the online platforms really are.

Overall, we have seen a development from small experiments with only single digit numbers of professional participants from single institutions, to more recent studies involving hundreds, if not thousands of financial professionals spanning multiple institutions and different geographic regions (e.g., Holzmeister et al., 2020; Rahwan et al., 2019). It stands to reason that these more comprehensive studies, of which some also attempt to replicate their own (and others') findings, allow us to gain a better understanding of which observations are truly robust and apply universally.

Common to all forms of recruitment is the issue of (self-)selection. The financial professionals who are interested in research and are willing to take part in experiments (repeatedly) may not be a random sample of all financial professionals. When participants know ex-ante that they will receive a monetary compensation for their participation, this issue might be aggravated. Employees with comparatively lower salaries might be more inclined to take part than a company's top-earners. This raises the question whether results from experiments with volunteering financial professionals, possibly even recruited from a single institution and across very different business divisions, generalize to a truly random sample of financial professionals.

3.3 Decision environments

Entwined with the issue of recruitment is the challenge of actually conducting the study. Clearly, professionals (and their respective superiors) prefer as little interruption of their usual work day as possible. At the same time, researchers are interested in having close control over the decision environment, the communication, and the interaction between participants. In the early days of experimenting with financial professionals, experiments would be conducted by recruiting professionals directly at their workplace and asking them to participate in a study. Typically, study materials were pen-and-paper-based and the sessions were conducted in conference rooms on-site at financial institutions (e.g., List & Haigh, 2005; Haigh & List, 2005). While the level of control of the decision situation can be described as rather high in these settings, the personal approach and individual recruitment have implications for the perceived (lack of) anonymity between experimenter and participants. Participants may feel identifiable and potentially perceive an obligation towards the experimenter, which may affect their decisions in the experiments. Whether this is a concern depends on the experimental task and the topic being studied.

Some studies were conducted by providing participants with the study materials to take home over the weekend and return a couple of days later (e.g., Muradoğlu & Önkal, 1994; Önkal &

Muradoğlu, 1996; Muradoğlu, 2002). In these cases, some control over the decision situation, participant's focus on the task, as well as the order of and the time between individual tasks, is given up in exchange for greater flexibility for participants. Compared to individual interviews and small group experiments on-site, take-home experiments also reduce the time that institutions and participants need to set aside from their usual working hours. As such, they are a fairly unobtrusive option that may be favored my many institutions.

While very few studies have brought professional participants to traditional experimental laboratories at universities and research facilities (e.g., Roth & Voskort, 2014)[5], the laboratory has been brought to the professionals instead. Teams that have set up temporary computerized laboratories at financial institutions and were able to largely replicate the tightly-controlled decision-environment on-site (e.g., Kirchler et al., 2018; Weitzel et al., 2020; Lindner et al., 2021). Naturally, the trade-off for institutions lies in the rather large disruption of the work day with relatively large groups of employees simultaneously taking part in an experimental session, potentially over the course of several days. For researchers, this setting comes with the added challenge of acquiring, transporting, preparing, and managing a mobile laboratory setup. Yet, in terms of the decision environment, privacy, and procedures, experiments conducted in mobile laboratories are probably closest to traditional laboratory experiments with student participants.

With fast access to the internet becoming ever more prevalent, experiments have also moved online. Online studies trade off control over the decision environment for substantial reductions in time and cost for experimenters and participants alike. As for any online studies, researchers have to prepare for participants being distracted, interrupted, or generally less attentive than in a dedicated laboratory environment. Some studies, especially those involving a large number of decisions or groups proceeding through the experiment simultaneously, might simply not be suitable for the online setting. As we will discuss in the next section, providing proper incentives and paying participants might also be more challenging in online settings.

3.4 Incentives

For many economists, the issue of incentives is a sanctuary in experiments. At the very least, experimental participants should be compensated adequately for the time they spend participating in the experiment, rather than engaging in their usual day-to-day activities. Better yet, experiments

[5]Three sessions with professionals were conducted in the laboratory, four on-site at the participating financial institutions.

should link the compensation to participants' performance, such that incentives exist to exert cognitive effort and make choices in line with true preferences (see Smith, 1976, for example). Naturally then, most experimentalists compensate participants with a combination of a fixed payment for participation and a performance-based component for their choices in the experiment. With financial professionals participating in experiments, however, deviating from these practices might be inevitable. When compliance guidelines outright forbid monetary payments for participation, compensation and incentivization have to fall back on other reward media. For example, extensive debriefing information including the research question(s), background information on the experimental methodology, and the results can be provided to participants after data collection has concluded. If advertised, this may act as an incentive to participate. When it comes to incentivizing performance in the experiment, results by Kirchler et al. (2018) suggest that for finance professionals public rankings could be used as a reward medium in lieu of monetary incentives. Others have argued that (monetarily) incentivizing decisions in experiments might not be necessary at all (see Camerer & Hogarth, 1999; Hackethal et al., 2022, for example).

If monetary payments to professionals are feasible nevertheless, the next question is on the appropriate stake size in order to sufficiently motivate participants and therefore induce meaningful behavior. Naturally, the compensation should be adjusted to participants' opportunity costs, i.e., to their foregone income from participation. While standard student samples have comparatively homogeneous earnings, commonly used samples of financial professionals can be considerably more heterogeneous with respect to their salaries (e.g., support staff, clerks, and c-level executives). It is thus not clear how stake sizes should be determined. For any given amount, it is likely that it would be too low for some participants of the sample and simultaneously too high for others. Assuming experimenters are indeed able to strike a suitable balance for studies involving financial professionals, the issue becomes even more apparent when the same study comprises additional samples, such as students. The most common approach to tackling this concern is compensating professionals by a multiple of the student's compensation for the same number of experimental currency units (mostly between two to four times the students' compensation; e.g., Haigh & List, 2005; Alevy et al., 2007; Cohn et al., 2014; Kirchler et al., 2018; Weitzel et al., 2020).

Outside of classical economic reasoning, paying different groups of participants different amounts for the completion of identical tasks is not without controversy. From an ethics perspective, for example, one might reasonably question why equivalent work should result in divergent pay.

It should also be noted that setting payments to be competitive with financial professionals' outside options can be prohibitively expensive for many researchers. If studies with large samples of highly selected financial professionals become the norm (and de facto requirement for publication), an undesirable compartmentalization of experimental and behavioral finance research can occur.

4 Conclusion

We surveyed 42 studies in the time period 1986–2022, which compare experimental results from financial professionals with those from students and other samples. The considered studies are all concerned with behavior in financial markets or behavior related to finance, more generally – we thereby covered a number of different topics relevant to the field of financial economics, such as risk and uncertainty, asset markets, and (financial) forecasting.

First, we set out to answer the overarching question of whether financial professionals actually behave differently to non-professionals or whether experimental results from convenience samples generalize to professionals. Overall, the evidence is mixed. Several studies report robust and convincing differences in the two participant groups' risk preferences: finance professionals, in particular, tend to be more risk loving than students or general population samples. Yet, recent evidence from large-scale experiments shows finance professionals to produce fewer and smaller price bubbles in experimental asset markets. Common treatment effects in experimental asset markets which have been found among student subjects, however, also hold among professional participants – despite smaller effect sizes. Assuming that there is indeed a comparatively small but non-zero effect in the population of finance professionals, it is not surprising that several early studies did not detect any statistically significant differences with rather small sample sizes. With respect to (financial) forecasting, it seems that finance professionals are just as good or bad as their non-professional peers or students. Similarly, earlier reports of an inherent banking culture of dishonesty among finance professionals could not be replicated in later studies, and several other differences in their individual characteristics subside after controlling for socio-economic characteristics. Despite these moderating effects, there is evidence showing financial professionals to be less trustworthy, more willing to compete, as well as more optimistic and overconfident.

From a methodological perspective, experimenting with financial professionals comes with a number of issues. The first challenge is to define the relevant participant group as precise as possible. "Financial professionals" can be anything from administrative support staff and bank tellers to

traders, fund managers, and executive managers in the finance industry. At best, to increase generalizability, researchers should recruit the participants most relevant for the decision task at hand and for its implications in the field. More often than not, however, it seems that anyone self-reporting to be a financial professional is deemed eligible for participation in such a study. Two related issues are how and where to recruit professionals (e.g., conferences and trade fairs, proprietary databases, government agencies, market research companies, or crowd-working platforms) and how and where to conduct the experiment (in a research lab, with a temporary lab-in-the-field at financial institutions, or online). No gold standard has emerged for these challenging experimental design questions. Each benefit of conducting the experiments in one fashion comes with its own set of limitations. Researchers must carefully consider these individual trade-offs in the context of their research agenda. Finally, one has to decide on the incentives put in place for professional and non-professional samples. When monetary incentives are used, special care needs to be taken to appropriately handle potentially diverging opportunity costs of participation between (and even within) samples. Despite the multitude of researcher degrees of freedom (see Simmons et al., 2011) – with substantially more flexibility in data collection than in standard laboratory experiments –, we observe no systematic pattern in design choices predicting significant / non-significant differences between financial professionals and other participant groups.

One might wonder whether this survey suffers from publication bias in that published studies, in both peer-reviewed journals and working paper series, are biased towards statistically significant effects as studies showing non-significant differences end up "in the file-drawer" (e.g., Brodeur et al., 2016, 2020). For studies examining differences between financial professionals and students, however, it seems somewhat more complex and the expected direction of a potential bias is not intuitive. Many early studies in this particular area are mainly concerned with the question of whether experimental results with student subjects generalize to financial professionals (see Füllbrunn et al., 2022, for example), aiming to demonstrate the experimental method's relevance and (external) validity. With this intention in mind, one would expect published studies to be biased towards showing *no* differences between subject groups. And indeed, most early studies we found and included in the survey yield no significant differences between professionals and other participants, albeit with very limited sample sizes – while more recent studies testing the same hypotheses with larger sample sizes reveal that there *are* significant differences. Nevertheless, there are also examples when the primary study reports a significant difference for financial professionals (Cohn et al., 2014), while a more recent study is not able to replicate this result with a larger, more diverse sample (Rahwan et al., 2019). Several potential limitations arise from

this example. As mentioned above, experimental results might differ between different groups of financial professionals. Moreover, seemingly insignificant design choices such as disclosing the purpose of the study to participants might also affect results. Lastly, as a related issue, there might be potential (self-)selection: in Rahwan et al. (2019), for example, only 2 out of 27 approached financial institutions agreed to participate (Cohn et al., 2019) – information which is generally not revealed in other studies but might bear important implications for experimenting with (financial) professionals.

Since the first studies involving financial professionals as participants in a controlled experiment in the 1980s, experimental finance has come a long way in examining their behavior in financial decision contexts. This literature already spans more than 40 studies and is growing rapidly. Each individual study, however, portrays one particular experimental design and one particular series of analyses, while many more "forking paths" leading to potentially different outcomes would be available (e.g., Simmons et al., 2011; Gelman & Loken, 2013). With limited sample sizes in early studies as well as analytical (Botvinik-Nezer et al., 2020; Menkveld et al., 2021) and design heterogeneity (Landy et al., 2020; Huber et al., 2022a) limiting the generalizability of a single study's results, we believe the future of experimenting with financial professionals could entail larger-scale studies involving direct and conceptual replication attempts but also extensions of previous results, next to a stronger focus on studies which make use of financial professionals' particular experience and expertise in financial decision situations.

References

Abbink, Klaus, Bettina Rockenbach (2006). Option pricing by students and professional traders: a behavioural investigation. *Managerial and Decision Economics*, *27*(6), 497–510.

Akerlof, George A., Rachel E. Kranton (2005). Identity and the Economics of Organizations. *Journal of Economic Perspectives*, *19*(1), 9–32.

Alevy, Jonathan E., Michael S. Haigh, John A. List (2007). Information cascades: Evidence from a field experiment with financial market professionals. *The Journal of Finance*, *62*(1), 151–180.

Anderson, Matthew J., Shyam Sunder (1995). Professional Traders as Intuitive Bayesians. *Organizational Behavior and Human Decision Processes*, *64*(2), 185–202.

Angrisani, Marco, Marco Cipriani, Antonio Guarino, Ryan Kendall, Julen Ortiz de Zarate (2020). Risk Preferences at the Time of COVID-19: An Experiment with Professional Traders and Students. Working Paper.

Banks, James, Leandro S. Carvalho, Francisco Perez-Arce (2019). Education, Decision Making, and Economic Rationality. *The Review of Economics and Statistics*, *101*(3), 428–441.

Bao, Te, Brice Corgnet, Nobuyuki Hanaki, Katsuhiko Okada, Yohanes E. Riyanto, Jiahua Zhu (2022). Financial forecasting in the lab and the field: Qualified professionals vs. smart students. Working Paper.

Barron, Orie E, Charles R Enis, Hong Qu (2021). Do financial professionals process information better as a group than non-professionals? *Journal of Risk and Financial Management*, *14*(5), 230.

Bernanke, Ben S (1983). Irreversibility, uncertainty, and cyclical investment. *The Quarterly Journal of Economics*, *98*(1), 85–106.

Botvinik-Nezer, Rotem, Felix Holzmeister, Colin F Camerer, et al. (2020). Variability in the analysis of a single neuroimaging dataset by many teams. *Nature*, *582*(7810), 84–88.

Brodeur, Abel, Nikolai Cook, Anthony Heyes (2020). Methods matter: P-hacking and publication bias in causal analysis in economics. *American Economic Review*, *110*(11), 3634–60.

Brodeur, Abel, Mathias Lé, Marc Sangnier, Yanos Zylberberg (2016). Star wars: The empirics strike back. *American Economic Journal: Applied Economics*, *8*(1), 1–32.

Burns, Penny (1985). Experience and decision making: A comparison of students and businessmen in a simulated progressive auction. In V. L. Smith (Ed.) *Research in Experimental Economics*, vol. 3, (pp. 139–157). JAI Press.

Camerer, Colin F, Robin M Hogarth (1999). The effects of financial incentives in experiments: A review and capital-labor-production framework. *Journal of risk and uncertainty*, *19*(1), 7–42.

Carlé, Tim A, Yaron Lahav, Tibor Neugebauer, Charles N Noussair (2019). Heterogeneity of beliefs and trade in experimental asset markets. *Journal of Financial and Quantitative Analysis*, *54*(1), 215–245.

Chernev, Alexander (2011). The dieter's paradox. *Journal of Consumer Psychology*, *21*(2), 178–183.

Cipriani, Marco, Roberta De Filippis, Antonio Guarino, Ryan Kendall (2020). Trading by Professional Traders: An Experiment. Working Paper.

Cohn, Alain, Ernst Fehr, Michel André Maréchal (2019). Selective participation may undermine replication attempts. *Nature*, *575*(7782), E1–E2.

Cohn, Alain, Ernst Fehr, Michel André Maréchal (2014). Business culture and dishonesty in the banking industry. *Nature*, *516*(7529), 86–89.

Cohn, Alain, Ernst Fehr, Michel André Maréchal (2017). Do Professional Norms in the Banking Industry Favor Risk-taking? *The Review of Financial Studies*, *30*(11), 3801–3823.

Cox, John C, Stephen A Ross, Mark Rubinstein (1979). Option pricing: A simplified approach. *Journal of Financial Economics*, *7*(3), 229–263.

DeJong, Douglas V, Robert Forsythe, Russell J Lundholm, Wilfred C Uecker (1985). A laboratory investigation of the moral hazard problem in an agency relationship. *Journal of Accounting Research*, (pp. 81–120).

DeJong, Douglas V., Robert Forsythe, Wilfred C. Uecker (1988). A note on the use of businessmen as subjects in sealed offer markets. *Journal of Economic Behavior & Organization*, *9*(1), 87–100.

Duchêne, Sébastien, Adrien Nguyen-Huu, Dimitri Dubois, Marc Willinger (2022). Risk-return trade-offs in the context of environmental impact: An experiment with finance professionals and students. Working Paper.

Forsythe, Robert, Thomas R. Palfrey, Charles R. Plott (1982). Asset Valuation in an Experimental Market. *Econometrica*, *50*(3), 537–567.

Fréchette, Guillaume R. (2015). Laboratory experiments: Professionals versus students. In G. R. Fréchette, & A. Schotter (Eds.) *The Methods of Modern Experimental Economics*, (p. 360–390). Oxford University Press.

Fréchette, Guillaume R. (2016). Experimental economics across subject populations. In J. H. Kagel, & A. E. Roth (Eds.) *The Handbook of Experimental Economics*, vol. 2, (p. 435). Princeton University Press.

Frederick, David M., Robert Libby (1986). Expertise and Auditors' Judgments of conjunctive Events. *Journal of Accounting Research*, *24*(2), 270–290.

Friedman, Daniel, Glenn W Harrison, Jon W Salmon (1984). The Informational Efficiency of Experimental Asset Markets. *Journal of Political Economy*, *92*(3), 349.

Füllbrunn, Sascha, Christoph Huber, Christian König-Kersting (2022). Experimental finance and financial professionals. In S. Füllbrunn, & E. Haruvy (Eds.) *Handbook of Experimental Finance*, (p. 64–72). Edward Elgar Publishing.

Füllbrunn, Sascha, Christoph Huber, Catherine C. Eckel, Utz Weitzel (2022). Heterogeneity of Beliefs and Trading Behavior: A Reexamination. *Journal of Financial and Quantitative Analysis*. Forthcoming.

Gajewski, Jean-Francois, Luc Meunier, et al. (2020). Risk preferences: are students a reasonable sample to make inferences about the decision-making of finance professionals? *Economics Bulletin*, *40*(4), 3000–3009.

Gelman, Andrew, Eric Loken (2013). The garden of forking paths: Why multiple comparisons can be a problem, even when there is no "fishing expedition" or "p-hacking" and the research hypothesis was posited ahead of time. Working Paper.

Gilad, Dalia, Doron Kliger (2008). Priming the risk attitudes of professionals in financial decision making. *Review of Finance*, *12*(3), 567–586.

Gill, Andrej, Matthias Heinz, Heiner Schumacher, Matthias Sutter (2022). Social preferences of young professionals and the financial industry. *Management Science*.

Glaser, Markus, Thomas Langer, Martin Weber (2007). On the Trend Recognition and Forecasting Ability of Professional Traders. *Decision Analysis*, *4*(4), 176–193.

Gneezy, U., J. Potters (1997). An Experiment on Risk Taking and Evaluation Periods. *The Quarterly Journal of Economics*, *112*(2), 631–645.

Guala, Francesco (1999). The problem of external validity (or "parallelism") in experimental economics. *Social science information*, *38*(4), 555–573.

Hackethal, Andreas, Michael Kirchler, Christine Laudenbach, Michael Razen, Annika Weber (2022). On the (ir) relevance of monetary incentives in risk preference elicitation experiments. *Journal of Risk and Uncertainty*. Forthcoming.

Haigh, Michael S., John A. List (2005). Do Professional Traders Exhibit Myopic Loss Aversion? An Experimental Analysis. *The Journal of Finance*, *60*(1), 523–534.

Hanaki, Nobuyuki (2022). Risk misperceptions of structured financial products with worst-of payout characteristics revisited. *Journal of Behavioral and Experimental Finance*, *33*, 100604.

Harrison, Glenn W, John A List (2004). Field Experiments. *Journal of Economic Literature*, *42*(4), 1009–1055.

Holmen, Martin, Felix Holzmeister, Michael Kirchler, Matthias Stefan, Erik Wengström (2021). Economic preferences and personality traits among finance professionals and the general population. Working Paper.

Holt, Charles A, Susan K Laury (2002). Risk aversion and incentive effects. *American Economic Review*, *92*(5), 1644–1655.

Holzmeister, Felix, Martin Holmén, Michael Kirchler, Matthias Stefan, Erik Wengström (2022). Delegation decisions in finance. *Management Science*. Forthcoming.

Holzmeister, Felix, Jürgen Huber, Michael Kirchler, Florian Lindner, Utz Weitzel, Stefan Zeisberger (2020). What Drives Risk Perception? A Global Survey with Financial Professionals and Laypeople. *Management Science*.

Hong, Harrison, Jeremy C Stein (2007). Disagreement and the stock market. *Journal of Economic Perspectives*, *21*(2), 109–128.

Huber, Christoph, Anna Dreber, Jürgen Huber, et al. (2022a). Competition and moral behavior: A meta-analysis of 45 crowd-sourced experimental designs. Mimeo.

Huber, Christoph, Jürgen Huber (2020). Bad bankers no more? Truth-telling and (dis) honesty in the finance industry. *Journal of Economic Behavior & Organization*, *180*, 472–493.

Huber, Christoph, Jürgen Huber, Laura Hueber (2019). The effect of experts' and laypeople's forecasts on others' stock market forecasts. *Journal of Banking & Finance*, *109*, 105662.

Huber, Christoph, Jürgen Huber, Michael Kirchler (2021). Market shocks and professionals' investment behavior–evidence from the covid-19 crash. *Journal of Banking & Finance*, *133*, 106247.

Huber, Christoph, Jürgen Huber, Michael Kirchler (2022b). Volatility shocks and investment behavior. *Journal of Economic Behavior & Organization*, *194*, 56–70.

Kaustia, Markku, Eeva Alho, Vesa Puttonen (2008). How Much Does Expertise Reduce Behavioral Biases? The Case of Anchoring Effects in Stock Return Estimates. *Financial Management*, *37*(3), 391–412. _eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1755-053X.2008.00018.x.

King, R. R., V. L. Smith, A. W. Williams, M. V. van Boening (1993). The robustness of bubbles and crashes in experimental markets. RH Day, Chen, P., ed. *Nonlinear Dynamics and Evolutionary Economics*.

Kirchler, Michael, Florian Lindner, Utz Weitzel (2018). Rankings and risk-taking in the finance industry. *The Journal of Finance*, *73*(5), 2271–2302.

Kirchler, Michael, Florian Lindner, Utz Weitzel (2020). Delegated investment decisions and rankings. *Journal of Banking & Finance*, *120*, 105952.

Kunz, Alexis H, Claude Messner, Martin Wallmeier (2017). Investors' risk perceptions of structured financial products with worst-of payout characteristics. *Journal of Behavioral and Experimental Finance*, *15*, 66–73.

Landy, Justin F, Miaolei Liam Jia, Isabel L Ding, et al. (2020). Crowdsourcing hypothesis tests: Making transparent how design choices shape research results. *Psychological Bulletin*, *146*(5), 451.

Levitt, Steven D, John A List (2007). What do laboratory experiments measuring social preferences reveal about the real world? *Journal of Economic Perspectives*, *21*(2), 153–174.

Lindner, Florian, Michael Kirchler, Stephanie Rosenkranz, Utz Weitzel (2021). Social motives and risk-taking in investment decisions. *Journal of Economic Dynamics and Control*, *127*, 104116.

List, John A., Michael S. Haigh (2005). A simple test of expected utility theory using professional traders. *Proceedings of the National Academy of Sciences*, *102*(3), 945–948.

List, John A., Michael S. Haigh (2010). Investment Under Uncertainty: Testing the Options Model with Professional Traders. *The Review of Economics and Statistics*, *92*(4), 974–984.

List, John A., Michael S. Haigh, Marc Nerlove (2005). A simple test of expected utility theory using professional traders. *Proceedings of the National Academy of Sciences of the United States of America*, *102*(3), 945–948.

Menkveld, Albert J, Anna Dreber, Felix Holzmeister, et al. (2021). Non-standard errors. Working Paper.

Mokros, Andreas, Birgit Menner, Hedwig Eisenbarth, Georg W Alpers, Klaus W Lange, Michael Osterheider (2008). Diminished cooperativeness of psychopaths in a prisoner's dilemma game yields higher rewards. *Journal of Abnormal Psychology*, *117*(2), 406.

Muradoğlu, Gülnur (2002). Portfolio managers' and novices' forecasts of risk and return: are there predictable forecast errors? *Journal of Forecasting*, *21*(6), 395–416. _eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1002/for.839.

Muradoğlu, Gülnur, Dilek Önkal (1994). An exploratory analysis of portfolio managers' probabilistic forecasts of stock prices. *Journal of Forecasting*, *13*(7), 565–578. _eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1002/for.3980130702.

Nagel, Rosemarie (1995). Unraveling in Guessing Games: An Experimental Study. *American Economic Review*, *85*(5), 1313–1326.

Noll, Thomas, Jérôme Endrass, Pascal Scherrer, Astrid Rossegger, Frank Urbaniok, Andreas Mokros (2012). A Comparison of Professional Traders and Psychopaths in a Simulated Non-Zero Sum Game. *Catalyst: A Social Justice Forum*, *2*(2).

Palan, Stefan (2013). A Review of bubbles and crashes in experimental asset markets. *Journal of Economic Surveys*, *27*(3), 570–588.

Plott, Charles R. (1982). Industrial Organization Theory and Experimental Economics. *Journal of Economic Literature*, *20*(4), 1485–1527.

Plott, Charles R., Shyam Sunder (1982). Efficiency of Experimental Security Markets with Insider Information: An Application of Rational-Expectations Models. *Journal of Political Economy*, *90*(4), 663–698.

Plott, Charles R., Shyam Sunder (1988). Rational expectations and the aggregation of diverse information in laboratory security markets. *Econometrica*, (pp. 1085–1118).

Rahwan, Zoe, Erez Yoeli, Barbara Fasolo (2019). Heterogeneity in banker culture and its influence on dishonesty. *Nature*, *575*(7782), 345–349.

Razen, Michael, Michael Kirchler, Utz Weitzel (2020). Domain-specific risk-taking among finance professionals. *Journal of Behavioral and Experimental Finance*, (p. 100331).

Roszkowski, Michael J., John E. Grable (2005). Estimating Risk Tolerance: The Degree of Accuracy and the Paramorphic Representations of the Estimate. SSRN Scholarly Paper ID 2252636, Social Science Research Network, Rochester, NY. Retrieved from https://papers.ssrn.com/abstract=2252636

Roth, Benjamin, Andrea Voskort (2014). Stereotypes and false consensus: How financial professionals predict risk preferences. *Journal of Economic Behavior & Organization*, *107*, 553–565.

Sarin, R. K., M. Weber (1993). Effects of Ambiguity in Market Experiments. *Management Science*, *39*(5), 602–615.

Schram, Arthur (2005). Artificiality: The tension between internal and external validity in economic experiments. *Journal of Economic Methodology*, *12*(2), 225–237.

Schwaiger, Rene, Michael Kirchler, Florian Lindner, Utz Weitzel (2020). Determinants of investor expectations and satisfaction. A study with financial professionals. *Journal of Economic Dynamics and Control*, *110*, 103675.

Simmons, Joseph P, Leif D Nelson, Uri Simonsohn (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science*, *22*(11), 1359–1366.

Smith, Vernon L. (1962). An Experimental Study of Competitive Market Behavior. *Journal of Political Economy*, *70*(2), 111–137.

Smith, Vernon L. (1976). Experimental Economics: Induced Value Theory. *The American Economic Review*, *66*(2), 274–279.

Smith, Vernon L., Gerry L. Suchanek, Arlington W. Williams (1988). Bubbles, Crashes, and Endogenous Expectations in Experimental Spot Asset Markets. *Econometrica*, *56*(5), 1119–1151.

Stefan, Matthias, Felix Holzmeister, Martin Holmén, Michael Kirchler, Erik Wengström (2022). You can't always get what you want: An experiment on finance professionals' decisions for others. Working Paper.

Tanaka, Tomomi, Colin F Camerer, Quang Nguyen (2010). Risk and time preferences: Linking experimental and household survey data from vietnam. *American Economic Review*, *100*(1), 557–71.

Tversky, Amos, Daniel Kahneman (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*(4157), 1124–1131.

Tversky, Amos, Daniel Kahneman (1983). Extensional versus intuitive reasoning: The conjunction fallacy in probability judgment. *Psychological Review*, *90*(4), 293.

Törngren, Gustaf, Henry Montgomery (2004). Worse Than Chance? Performance and Confidence Among Professionals and Laypeople in the Stock Market. *Journal of Behavioral Finance*, *5*(3), 148–153.

Weitzel, Utz, Christoph Huber, Jürgen Huber, Michael Kirchler, Florian Lindner, Julia Rose (2020). Bubbles and financial professionals. *The Review of Financial Studies*, *33*(6), 2659–2696.

Zaleskiewicz, Tomasz (2011). Financial forecasts during the crisis: Were experts more accurate than laypeople? *Journal of Economic Psychology*, *32*(3), 384–390.

Önkal, Dilek, Gülnur Muradoğlu (1996). Effects of task format on probabilistic forecasting of stock prices. *International Journal of Forecasting*, *12*(1), 9–24.

A Appendix

A.1 Risk and Uncertainty

Table A.1: Articles on risk and uncertainty

Article	Environment	Duration	Incentives	Average payments
Haigh & List (2005)	controlled	25 min	proper	Students: USD 10 Professionals: USD 40
List & Haigh (2005)	controlled	-	proper	not reported
Roszkowski & Grable (2005)	uncontrolled	30-60 min	none	-
Gilad & Kliger (2008)	controlled	-	Students: fixed Professionals: none	Students: NIS 45 (USD 10)
List & Haigh (2010)	controlled	30 min	proper	Students: USD 11.75 Professionals: USD 47
Roth & Voskort (2014)	controlled	50 min	proper	EUR 11.92
Kirchler et al. (2018)	controlled	45 min	proper	Professionals: EUR 52 Students: EUR 18
Angrisani et al. (2020)	controlled + online	-	proper	Students: GBP 25 Professionals: GBP 250
Gajewski et al. (2020)	Students: controlled + online Professionals: online	-	Students: proper Professionals: -	Students: EUR 5.70
Holzmeister et al. (2020)	online	-	-	-
Huber et al. (2021)	online	20 min	proper	Students: EUR 5.45 Professionals: EUR 20.27
Razen et al. (2020)	online	11 min	fixed	USD 25 (with 20% chance)
Hanaki (2022)	online	25 min	proper	not reported
Stefan et al. (2022)	online	45 min	proper	SEK 238.9 (USD 30)

Haigh & List (2005). The professionals were 54 "locals, brokers, clerks and exchange employees (e.g., floor managers or and market reporters) who worked in the open outcry environment" (p. 527) with multiple years of experience from the Chicago Board of Trade (USA). No differences between different participant types among the professionals were found. The 64 undergraduate students were recruited at the University of Maryland. Student sessions were conducted in a laboratory-like setting on campus. Professionals took part in a dedicated room at the CBOT. Students earned USD 0.01 per unit while professionals received USD 0.04 per unit.

List & Haigh (2005). The professionals were 54 "locals, brokers, clerks and exchange employees (e.g., floor managers or and market reporters) who worked in the open outcry environment" (p. 946, footnote k) with multiple years of experience from the Chicago Board of Trade (USA). No differences between different participant types among the professionals were found. It is not

explicitly stated whether these are the exact same professionals as in Haigh & List (2005). Undergraduate students were recruited at the University of Maryland (College Park). Student sessions were conducted in a laboratory-like setting on campus while the professionals took part at CBOT. Students received USD 0.01 per unit, professionals got USD 0.04 per unit.

Roszkowski & Grable (2005). The professionals were 386 financial advisors from all parts of the United States of America who had graduated The American College's Master's in Financial Services (MSFS) Program. The majority worked in the life and health insurance sector (64%) with the next biggest group working in financial planning (17%). Each participating advisor was asked to select some of their clients, resulting in a sample of 458 laypeople from all regions in the US. 45% of these participants worked in the private sector and 42% reported to be self-employed. No control was exercised over the environment while filling-in the SOFRT questionnaires.

Gilad & Kliger (2008). The professional participants were 44 investment advisors working in large commercial banks and accountants from CPA firms. The student sample consisted of 52 undergraduate students of economics. Although not explicitly stated, it is reasonable to assume that all participants were from Israel, as payments were made in Israeli New Shekel (NIS). The experiments took place in a controlled laboratory setting.

List & Haigh (2010). The professionals were 55 commodity (futures) and option traders from the Chicago Board of Trade (USA). The student sample consisted of 75 undergraduate students from the University of Maryland. Students earned USD 0.01 per unit while professionals received USD 0.04 per unit.

Roth & Voskort (2014). There are three different samples in this study. The first sample of professionals were 38 senior professionals from large financial advisory agencies and local banks in Germany. The second sample consisted of 52 junior professionals from a banking specific advanced training institution (applied university) in Germany. The third sample included 77 students from Heidelberg University (Germany). All sessions took place in controlled environments either in the laboratory at Heidelberg University (all sessions with non-professionals and three sessions with professionals) or on-site at the institutions (four sessions with professionals).

Kirchler et al. (2018). We focus on the main treatments for the relevant comparison of financial professionals and students. A total of 252 professionals and 432 students participated in lab-in-the-field experiments. Professionals were recruited from "major financial institutions in several OECD countries" and worked in "private banking, trading, investment banking, portfolio management, fund management, and ealth management" (p. 2278). Professionals took part in a mobile laboratory which was set up in conference rooms at participating financial institution. To create some degree of anonymity, sessions were generally populated with professionals from different institutions. Students from multiple disciplines and programs of study were recruited at the University of Innsbruck (Austria) and took part in the local experimental laboratory. One fifth of the

professionals participants was randomly selected for payment, with professionals receiving EUR 52 on average (maximum EUR 600) for 45 minutes. Average payments were approximately 2.7 times the professionals after tax hourly wage. Students' incentives were "scaled down to one-third of the professionals' payoffs" (p. 2283), resulting in average payments of EUR 18 (maximum EUR 323).

Angrisani et al. (2020). The study was conducted in two waves, about 13 months apart. The first wave was conducted in an experimental laboratory, while the second wave of data collection took place online. The same participants that took part in the first wave were invited to take part in the second. The professionals were traders, proprietary traders, sales-traders, portfolio managers, and others, with the majority being traders of some kind. They were described as working "in a variety of financial markets, such as equity, equity derivatives, FX, fixed income, and commodities" (p. 5). Students were undergraduates from various disciplines. Notably, 80% of the student sample is male, which is close to the male gender ration in the professional sample of 86% . The data analysis is based on 48 financial professionals and 60 students who took part in both waves. In the first wave, professionals (students) earned GBP 3.70 (4.90), while in the second wave professionals (students) earned GBP 4.10 (4.90) for the main task the article reports on. In the first wave, the experiment had multiple other parts resulting in average earnings of professionals (students) of GBP 250 (25). In the second wave, participants received an additional fixed fee of GBP 25 in addition to their earnings from the task.

Gajewski et al. (2020). The article reports on three samples. Professionals were 57 French wealth advisers recruited via an e-mail to the French professional association. The professionals took part online but the article does not mention any monetary compensation for participation. A sample of 102 French business school students participated in the laboratory. They faced proper incentives and earned EUR 5.70 on average. A second sample of 448 students from the same institution took part online. No monetary compensation is mentioned for this sample.

Holzmeister et al. (2020). The 2213 finance professionals in this study are split 86%/14% between the finance and the insurance industry. They work in accounting and controlling, advisory services, analysis and research, fund and portfolio management, administration, investment banking, private banking, risk management, sales, general management, trading, and brokerage. The laypeople sample consists of 4559 members of the general population (not working in finance or the insurance industry) from Brazil, China, Germany, India, Japan, Russia, United Kingdom, United States of America, and South Africa. The experiment was conducted online and no performance based payments were made. There is no mention of fixed payments in the article either.

Huber et al. (2021). Two waves of data collection are reported in this article. The first wave was conducted in December 2019. 202 financial professionals and 282 students participated. The second wave of data collection followed in the first month of the COVID-19 pandemic (March 2020) with an additional 113 professionals and 216 students. Notably, different participants took

part in the two waves to ensure that wave two participants could not recall their previous experience in the experiment. All data was collected online. The professionals were recruited from the before.world participant pool and included job functions such as investment and portfolio management, trading, and financial advice. The student sample consisted of economics and business students from the Innsbruck EconLab subject pool at the University of Innsbruck, Austria. Decisions in the experiment were monetarily incentivized for both students and professionals. Students received an endowment of EUR 5 while professionals started with EUR 20 . The experiment took about 20 minutes to complete and average total payments were EUR 20.27 for financial professionals and EUR 5.45 for students.

Razen et al. (2020). The professional sample comprised 202 US financial professionals working as advisors, in sales, as portfolio and risk managers, or in support functions. The non-financial professional sample included 408 participants from the US general working population. This sample included mostly people working in services, education, and manufacturing and construction. All data was collected online in May 2018. The participants were recruited on before.world and via an international market research company. One out of five participants were randomly selected to be paid for their participation and received a flat fee of USD 25. The experiment took on average 11 minutes of their time.

Hanaki (2022). Eighty-four Certified Financial Accountants (CFA) and 87 students from the University of Osaka, Japan, were recruited for the online experiment. The professionals had previously participated in finance experiments and indicated to be willing to participate again. After removing the 10% fastest and 10% slowest participants as well as enforcing monotonicity in responses, the analysis is based on the decisions of 64 professionals and 63 students. Professionals (students) received a fixed payment of JPY 1000 (500) and JPY 10 (5) for each experimental currency unit earned in the experiment. Ten percent of the participants were selected for real payments administered via Amazon gift certificates (emailed to participants). The experiment took 25 minutes to complete.

Stefan et al. (2022) and Holzmeister et al. (2022). The two articles report on on different elements of fundamentally the same experiment. As such, they share the same sample characteristics and experimental details. The financial professionals were 408 Swedish financial analysts, investment advisors, traders, fund managers, financial brokers, among others. The sample of laypeople consisted of 550 non-financial professionals. Invitations were sent to a representative sample of the Swedish working population. All observations were collected online.

A.2 Asset Markets

Table A.2: Articles on asset markets

Article	Environment	Duration	Incentives	Average payments
DeJong et al. (1988)	controlled	Students: 180 min Professionals: 120 min	proper	Students: USD 10-25 Professionals: Prize or nothing
King et al. (1993)	controlled	90 - 120 min	proper	Students: USD 13 Professionals: ca. USD 21 (+60%)
Sarin & Weber (1993)	controlled	120 min	proper	Students: DEM 11-38 Professionals: DEM 46-64
Anderson & Sunder (1995)	controlled	180 min	proper	USD 6-65
Cipriani et al. (2020)	controlled	120 min	proper	Students: GBP 23.35 Professionals: GBP 234.93
Weitzel et al. (2020)	controlled	70-75 min	proper	Students: EUR 17-19 Professionals: EUR 70-75

DeJong et al. (1988). The professional sample consisted of 5 partners in public accounting and auditing firms as well as 2 corporate financial officers. All professionals had at least 15 years of experience. Student participants were recruited from the College of Business at the University of Iowa, USA. Students received between USD 10 and USD 25 for their participation. Professionals received a university souvenir if they earned more on average per round than a matched student participant. They did not receive anything if they did not earn more. According to the authors, paying professionals in cash would have been prohibitively expensive and receiving tangible evidence of having beaten the student (the souvenir) was believed to be a suitable alternative.

King et al. (1993). "Six over-the-counter traders familiar with computerized stock quotation systems" participated in "Experiment 293; 6, 3i" (p. 196). The most comparable experiment had 6 student participants with one round of experience and 3 informed student participants. Student participants were recruited at the University of Arizona in Tucson (AZ), Indiana University in Bloomington (IN), and Washington University in St. Louis (MO), USA. Students received between USD 3 and USD 34 (average USD 13), while professionals received about USD 21. Decisions were properly incentivized.

Sarin & Weber (1993). "[W]e created markets using eight executives of J. P. Morgan in Frankfurt, who were bond or currency traders or advisors and had a minimum of two years of work experience." (Experiments 9 and 10; p. 604). In addition, there where twelve markets with eight student subjects each, recruited at Aachen University or Cologne University (Experiments 1-8 and 11-14). All experimental sessions lasted around two hours; students earned between DEM 11 and DEM 38, professionals between DEM 46 and DEM 64 (at the time of the experiments the exchange rate was approximately USD 1 to DEM 2). Decisions were properly incentivized.

Anderson & Sunder (1995). The 21 professionals had about 5 years of experience working at stock and bond underwriting houses and the Minneapolis Commodity Exchange, USA. They took part in two markets with 12 and 9 traders, respectively. The student sample comprised MBA students trained in finance, statistical methods, and risk analysis from two state universities. They took part in 3 markets with 12, 11, and 8 traders, respectively. Experiments took about 180 minutes to conduct in a controlled, laboratory-like setting. Payments ranged from USD 6 to USD 65.

Cipriani et al. (2020). A total of 56 traders and portfolio managers from London (UK) who were working in a variety of different markets (equity, equity derivatives, foreign exchange, fixed income, commodities, etc.) and had an average tenure of 9.25 years took part in the experiment. The comparison sample of 56 undergraduate students was recruited at Central London University, UK. The student sample had approximately the same gender composition (79% male) as the professional sample (86% male). Experimental sessions took about 120 minutes to conduct and participants received performance-based pay. Professionals received GBP 2.50 per 100 experimental currency units, while students received GBP 0.25 per 100 units. Average task earnings were GBP 234.93 (USD 306) for professionals and GBP 23.35 (USD 30.45) for students. The experiment was conducted in the laboratory.

Weitzel et al. (2020). The paper reports on two sets of treatments. For the first set, the professional sample consisted of 294 financial professionals from central and northern European countries working in private banking, trading, investment banking, portfolio management, fund management, and wealth management. For the second set, it consisted of 118 professionals (avg. 9 year tenure) from major financial institutions in Austria and the Netherlands. The student samples both consisted of students from the University of Innsbruck (Austria) and Radboud University Nijmegen (the Netherlands). A total of 384 students participated in the first set and 118 additional students participated in the second set of treatments. The main sessions took place in laboratory-like settings. Sessions in the first set took about 70 minutes to complete and paid on average EUR 76.5 (EUR 18.6) to professionals (students). The second set was slightly longer at approximately 75 minutes. Payments were 71.3 EUR (EUR 17.5) on average for professionals (students).

A.3 Forecasting

Table A.3: Articles on Forecasting

Article	Environment	Duration	Incentives	Average payments
Muradoğlu & Önkal (1994)	take-home	2.5 days	none	-
Önkal & Muradoğlu (1996)	take-home	2.5 days	none	-
Muradoğlu (2002)	take-home	2.5 days	none	-
Törngren & Montgomery (2004)	take-home	30 days	-	-
Glaser et al. (2007)	online	60 min	Students: fixed Professionals: none	-
Kaustia et al. (2008)	controlled	15-20 min	none	-
Zaleskiewicz (2011)	online	$\leq$ 1 day	none	-
Huber et al. (2019)	online	16 min	proper	USA: USD 24.87 UK: GBP 19.27 1 out of 4 tasks paid
Schwaiger et al. (2020)	controlled	10 min	fixed	Students: EUR 6 Professionals: EUR 18
Barron et al. (2021)	online / take-home	87 min	none	-
Bao et al. (2022)	online	3 × 15-30 min, 1 × 3-4 days	proper	Students: JPY 915 Professionals: JPY 4,877 (Tasks 1-3 out of 4)

Muradoğlu & Önkal (1994). The professionals sample consists of 7 licensed brokers and portfolio managers from Istanbul, Turkey, who are managing investment funds and give financial advice to clients. The second sample can be described as a sample of semi-professionals. These are 10 bank employees who were recently trained in portfolio management in Ankara, Turkey. Participants could take the study materials home and were asked to return them within 2.5 days. Participants were not paid for their participation.

Önkal & Muradoğlu (1996). This article uses a setting that is very similar to Muradoğlu & Önkal (1994). The professionals were 13 licensed brokers and portfolio managers from Istanbul, Turkey. The second sample consists of 9 bank employees that were recently trained in portfolio management. A third sample consisted of 64 university students from the Faculty of Business Administration of Bilkent University, Turkey. Participants could take the study materials home and complete them within 2.5 days. They did not receive any payments.

Muradoğlu (2002). This is a third paper using the familiar setting of Önkal & Muradoğlu (1996) and Muradoğlu & Önkal (1994). Professionals are 35 brokers, fund managers, analysts, and financial advisors from Istanbul, Turkey. The participants had between 8 months and 6 years of work experience and were participating in a 20 hour training program on portfolio management and financial forecasting. The student sample comprises 45 undergraduate and graduate students from the Faculty of Business Administration of Bilkent University, Turkey. The students had at least one finance course and were exposed to concepts like the efficient market hypothesis and methods

of financial forecasting. Once again, participants could take the study materials home and were expected to return them after 2.5 days. No payments were made.

Törngren & Montgomery (2004). Financial professionals are described as stock market professionals such as portfolio managers, analysts, brokers, and investment counselors. The professionals had on average 12 years of experience. The student sample was recruited from undergraduate students in psychology at Stockholm University, Sweden. The article reports on two studies and highlights that a large overlap in the professional participants between the two studies is likely. There were 33 financial professionals and 29 students in study 1. In study 2, there were 21 financial professionals and 34 students. Participants received the study materials and had to return them after 30 days. No monetary compensation is reported.

Glaser et al. (2007). The professionals are 31 employees from a large bank in Germany. They had 5 years of experience on average and primarily worked in fields such as derivatives, proprietary trading, and market making. The student sample comprised 64 advanced students specializing in banking and finance at Mannheim University, Germany. The experiment was conducted online and took about 60 minutes to complete. Professionals did not receive any payments, while students received fixed payments.

Kaustia et al. (2008). Professionals are 300 financial advisers, institutional investors, asset managers, analysts, investment experts, brokers, wealth managers, stock specialists and administrative staff from Finland and Sweden. They were recruited at field seminars on financial markets and professional education sessions. 213 undergraduate finance students from Helsinki School of Economics, Finland, serve as the control group. The experiments were conducted in controlled, laboratory-like environments and took about 20 minutes to complete. No compensation was paid.

Zaleskiewicz (2011). Professional participants were 38 financial analysts from Poland, who worked for banks and mutual funds and had a mean work experience of 7 years. As part of their job, they were forecasting changes in the economics system. The comparison group are 43 members of the Polish general population without any specific knowledge or experience in the stock market. Participants were contacted personally or by email on the day of the study and asked to submit their forecasts. No information is given on the study materials, the duration of the forecasting task, or any monetary compensation for participation.

Huber et al. (2019). The experiment was conducted in the United Kingdom as well as the United States of America. For each country, a separate sample of financial professionals and separate sample from the general population was recruited. In the UK, 100 financial professionals and 607 members of the general population participated. In the USA, the experiments were conducted with 269 financial professionals and 617 laypeople. Recruitment was done by a large globally operating market research company. No further information is given about the job descriptions of the financial professionals. The experiments were conducted online and took about 16 minutes

to complete on average. Participants received performance incentives with 20% being selected for actual payments. The average payment in the USA (UK) was USD 24.87 (GBP 19.27 / USD 25.44).

Schwaiger et al. (2020). Professionals are 150 individuals mainly working in financial advice, fund management, as well as investment and portfolio management. They were recruited from various financial institutions in northern and central Europe. The professionals had on average 13.2 years of experience. The student sample consists of 576 students of various disciplines from the University of Innsbruck, Austria, and was approximately gender matched to the professional sample (77% male). Payments were fixed at EUR 18 for professionals and EUR 6 for students. The experiment took about 10 minutes to complete. While students participated at the campus laboratory, professionals took part in a controlled lab-in-the-field environment.

Barron et al. (2021). The professional sample included 69 professional investors from various financial institutions. The sample includes financial analysts, brokers, investment advisors, fund managers, and portfolio managers among others. They were recruited via personal contacts, referrals, and on the professional social network LinkedIn. The comparison group are 121 non-professional investors who are members of the American Association of Individual Investors. Similar to earlier studies with take-home materials, participants were emailed the study documents and asked to return them later. It took 87 minutes on average to complete the tasks. While it is not explicitly stated in the article, it seems that the participants volunteered and did not receive any payments for their participation.

Bao et al. (2022). Professionals are 212 CFAs (93.4% male) who are certified members of the Securities Analysts Association of Japan (SAAJ) and were recruited via SAAJ. The comparison sample includes 228 students (53.5% male) from Osaka University. Participants were recruited by email. Tasks 1-3 each took between 15 and 30 minutes. For Task 4, participants had 3 or 4 days to submit their forecasts. Payoffs depended on forecasting accuracy and were paid as Amazon gift cards, whereby professionals received five times students' incentives. Average payments for professionals (students) were JPY 1,362 (JPY 316), JPY 1,675 (JPY 284), and JPY 1,840 (JPY 315), in Tasks 1, 2, and 3. In Task 4 the most accurate professional (student) forecaster received JPY 5,000 (JPY 1,000).

A.4 Individual Characteristics, Culture, and Context

Table A.4: Articles on individual characteristics, culture, and context

Article	Environment	Duration	Incentives	Average payments
Noll et al. (2012)	controlled, individual meetings	-	none	-
Cohn et al. (2014)	online	15 min	proper	Students: USD 50 Professionals: USD 200 Laypeople: USD 200
Cohn et al. (2017)	online	26 min	proper	up to USD 500
Lindner et al. (2021)	controlled	45 min	proper	Students: EUR 17 Professionals: EUR 48
Rahwan et al. (2019)	online	10 min	proper	Asia pacific: USD 14/coin toss max: USD 140
Huber & Huber (2020)	online	9 min	proper	Students: EUR 4.66 Professionals: EUR 8.16
Holmen et al. (2021)	online	15 min	proper	SEK 211.13

Noll et al. (2012). The first sample consists of 28 professional bank traders (equities, commodities, etc.). One half worked for large international banks, the other half worked for medium-sized banks. No location is given. The second sample are 24 individuals diagnosed with moderate to severe levels of psychopathic personality disorder. These were recruited in German high security psychiatric hospitals. The third sample are 24 non-academic men from the general population from Regensburg, Germany. Notably, all participants took part in individual sessions and played against a computer opponent programmed to play a tit-for-two-tats strategy. Session lengths are not given in the article. Participants did not receive any payments.

Cohn et al. (2014). There are three samples in this study. The financial professionals are 128 employees from a large international bank with about 11.5 years of experience on average. About half of the financial professionals worked in "core business units, i.e., as private bankers, asset managers, traders, or investment managers" (supplementary material, p. 2), while the other half worked in supporting roles in risk management and human resources management. All participants are described as bank. A location is not revealed. The second sample are 222 students from an undisclosed university. The third sample are 133 members of the working population with 14.8 years of experience in their respective fields on average. These people were employed in the middle or upper management of manufacturing, pharmaceutics, telecommunications, and information technology companies. Participants took part in an online experiment that took approximately 15 minutes to complete. Financial professionals and members of the general working population received gift cards of up to USD 200 in value and 20% of the professional participants were paid. Students received up to USD 50 ("reduced the stake size by a factor of four.", supplementary material, p. 7).

Cohn et al. (2017). This paper apparently uses the same sample of financial professionals and the same sample of members of the general working population as Cohn et al. (2014), which becomes

apparent from the identical sample sizes and summary statistics. In addition, it includes a sample of 142 banking employees from many smaller and larger banks. These financial professionals predominantly worked in asset management, private banking, and trading and investment banking. Work experience was relatively high with 25 years on average. All sessions were conducted online and took about 26 minutes to complete. Participants were endowed with USD 200 and could earn up to USD 500 in the tasks. About every fifth participant was paid.

Lindner et al. (2021). The professional sample consists of 330 employees from major financial institutions from several OECD countries. On average, the professionals reported 12.6 years of experience and worked in private banking, trading, investment banking, portfolio management, fund management, and wealth management. The student sample was recruited at the University of Innsbruck, Austria, and consisted of 864 bachelor and master students. The sessions took place in controlled, lab-like environments and took about 45 minutes to complete. Participants received performance-based payments with professionals (students) earning on average EUR 48 (EUR 17). Stakes for the professionals were three times the stakes of students.

Rahwan et al. (2019). The article reports on several samples and multiple studies. We focus on the samples most relevant to the comparison of financial professionals an non-professionals. First, there are 620 bankers from a "large bank in the Asia Pacific region" (p. 346). From the same region, they also collect a sample of 242 non-banking employees, aiming to be "nationally representative for gender and age" (p. 346). Then, there are 148 bankers from the a "medium-sized bank in the Middle East", as well as 67 "regulators of financial services" (p. 346). Participants could earn USD 14 in local currency for each of 10 coin tosses, resulting in a maximum pay of approximately USD 140. A lottery mechanism was used to pay about 10% of the participants. Participants received shopping vouchers. The non-banking participants did not receive monetary payments, but charitable donations were made instead.

Huber & Huber (2020). A total of 223 financial professionals participated in the experiment. Of these, 115 were recruited on before.world, while the remaining 108 participants were recruited on Prolific. Participants from the before.world pool worked mainly as portfolio managers, fund managers, investment managers, traders, analysts, consultants, and financial advisors. Selection on Prolific was based on participants reporting to work in the finance and insurance industry. The student sample consisted of 166 students from the University of Innsbruck, Austria. All participants took part online and completed the experiment in 9 minutes on average. Professionals from before.world earned 8.16 EUR on average, while professionals on Prolific received EUR 3.64 (paid in GBP) on average. Students earned EUR 4.66 on average. Payments for participants on Prolific as well as students were reduced by half compared to the financial professionals in the before.world sample.

Holmen et al. (2021). The first sample are 298 financial analysts, advisors, traders, fund managers, and financial brokers from Sweden. The second sample are 395 members of the Swedish general

working population (excluding financial professionals). The experiment was conducted online and could be completed in 15 minutes. Participants received a participation fee of 100 SEK (EUR 10) and earned on average SEK 211.13 (EUR 23.50).

A.5 Miscellaneous

Table A.5: Articles on miscellaneous topics

Article	Environment	Duration	Incentives	Average payments
Frederick & Libby (1986)	controlled	5-10 min	none	-
Abbink & Rockenbach (2006)	controlled	Students: 60-120 min Professionals: 60 min	proper	-
Alevy et al. (2007)	controlled	30 min	proper	see below.
Duchêne et al. (2022)	controlled	45 min	proper	Students: EUR 13.45 Professionals: EUR 216.81

Frederick & Libby (1986). Five experiments are reported in the article. Experiments 1 and 2 were conducted with professionals. Experiments 3 to 5 with students. The professionals were auditors from one of the largest CPA firms with 2.5-3.5 years of experience, who were attending a two-week training program. Students were undergraduates taking auditing classes and MBA students of advanced accounting. Experiments 1 and 2 were conducted with 33 and 31 professionals, respectively. Experiments 3, 4, and 5 were conducted with 49, 40, and 24 student participants, respectively. Participants did not receive any payments.

Abbink & Rockenbach (2006). There were three samples of participants in this study. The professionals were 24 bank employees from Frankfurt, Germany, who mainly worked in foreign exchange, security, futures, bonds, and money trade. All reported to be decision-makers in their fields. The first student sample consisted of 108 students from Bonn University, Germany. They were mostly studying economics and law. The authors emphasize that their education is highly technical with many theory-oriented courses and a strong focus on mathematics. While option pricing is part of the curriculum, they did not have any prior experience with financial market experiments. The third sample were students with a mainly non-technical, social-science majors from the University of Erfurt, Germany. This group did not receive any formal training in option pricing as part of their curriculum. All participants took part in controlled, laboratory-like environments. Due to time limitations, sessions with professionals were shortened from 50 to 30 decision rounds. The exchange rate for experimental currency units was adjusted to yield payments comparable to the student treatments.

Alevy et al. (2007). Financial professionals are 55 "market professionals" from the Chicago Board of Trade (CBOT), USA. The students were undergraduates from the University of Maryland (College Park), USA. The experiments were conducted in controlled, lab-like environments at the CBOT (professionals) and on campus (students). Students started the experiment with an endowment of USD 6.25 while professionals received an endowment of USD 25. As losses could be incurred in the experiment, additional games were played in each session to ensure positive balances of all subjects at the end of the experiment. Average earnings are given separately by

sample, urn type (asymmetric or symmetric), and gain / loss domain in their Table II. Payments to professionals were approximately 4x those of students.

Duchêne et al. (2022). The professional sample consisted of 190 financial professionals from major financial institutions (investment banks and asset management companies) of Morocco. The experiment was conducted on-site in Casablanca using a mobile laboratory setup. The professional sample mainly included, among others, proprietary traders, sales traders, asset managers, trading room managers, quantitative engineers, structurers, and financial analysts. In addition, 279 students from the University of Montpellier, France, took part in a standard laboratory setting. Professionals received 1 EUR per experimental currency unit, while students received 0.04 EUR per currency unit. While only 10% of professionals were paid, all students received a payment. On average over those selected, professionals earned EUR 216.81. Students were paid EUR 13.45 (EUR 8.10 excluding show-up) on average.

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Christoph Huber, Christian König-Kersting

Experimenting with Financial Professionals

Abstract
Financial professionals play a key role in financial markets and the financial industry as a whole. Researchers in experimental economics and finance have therefore started to employ financial professionals as experimental participants. We examine this recent development in the field by reviewing 42 studies from the time period 1986–2022 which compare experimental results from samples of professionals in the finance industry to those from other samples. The considered studies cover a wide array of issues relating to the finance industry, such as risk and uncertainty, asset markets, and financial forecasting, among others.With this comprehensive review, we contribute to recent discussions about external validity and generalizability, aim to synthesize the relevant experimental results, and discuss the key methodological considerations in experimenting with financial professionals.

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