Experimental Finance 2016
at the University of Mannheim

We are delighted to welcome you in St. Martin to the

Experimental Finance 2016

The conference serves as the 7th annual meeting of the Society for Experimental Finance and centers around the application of experimental methods to financial decision making.

We hope you agree with us that we have arranged a very interesting program with excellent scientific contributions from all over the world; in particular we would like to welcome Professor Armin Falk and Professor Terrance Odean, our keynote speakers.

We would also like to thank our sponsors the German Research Foundation, the University of Mannheim, the Faculty of Business Administration, and the Department of Finance.

Please find enclosed general information, the program, abstracts of all presentations, and a list of participants.

If you have any questions, do not hesitate to let us know.

Enjoy the conference!

Alexandra Niessen-Ruenzi, Christoph Merkle, and Michael Kirchler

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Some general information

PROGRAM: Talks have been planned according to the recommendations of the referees, the speakers' availability, and according to topics. There will be two keynotes, three plenary sessions, and 14 parallel sessions.

TALKS: The slot for a presentation is 20 minutes, i.e., 15 minutes talk + discussion.

- @speakers: Please keep your talk efficient and to the point such that you are able to provide the main message of the paper on time (e.g., do not explain every detail of an SSW experimental design, or tell us that using experiments makes sense for your research (we believe you)). Please put your talk on the presenter notebook before the session starts.
- @discussants: As in previous years, we have a discussant for each talk. In most of the sessions each speaker is the discussant of another speaker in the same session (see program). Please get in contact with the speaker and ask her/him to send the paper/slides before the conference. After the talk your job is to first provide comments on the paper (no slides necessary for the discussant) and then to lead the discussion, i.e., you serve as kind of a starter of the discussion with one or two initial comments or questions.
- @chairs: As usual the last speaker in a session is the chair.

BUS: We organized a bus transfer back to Mannheim main station on Friday. The first bus leaves before lunch at 1.00 pm. Another bus will transfer those who wish to leave after lunch at 2.30 pm.

FOOD: We tried to take your wishes into account and the venue is instructed accordingly. The conference fee includes lunch, dinner and a wine tasting but no breakfast. If you book a room at one of the reserved hotels, breakfast is included in the room fee. There will be an informal pre-conference dinner on Tuesday evening for those who are arriving early (not included in the conference fee).

MORE: The conference will also feature a social program, which includes a hike in the beautiful vineyards and forests of the Palatinate. Local tour guides will prepare this tour and show us the best views on the Rhine valley. On Thursday evening we will enjoy a wine tasting, at which local winemakers will present their products.

Sponsors

German Research Foundation

The German Research Foundation (Deutsche Forschungsgemeinschaft) serves all branches of science and the humanities in Germany by funding research projects and facilitating national and international collaboration among researchers.
The DFG devotes particular attention to the advancement and training of early career researchers.
It advises parliaments and public interest institutions on scientific matters and fosters relations between the research community and society and the private sector.

The University of Mannheim

With its unique blend of renowned Economic and Social Sciences that are interwoven with excellent Humanities, Business, Law, Mathematics and Informatics, the University of Mannheim excels in both research and teaching. This interdisciplinary approach ensures long-term competitiveness of its researchers and graduates who are working in national and international enterprises or research centers. The clear-cut portfolio of academic programs is one of the key features of the University of Mannheim, and as such, enhances the visibility of research and teaching.
It is the University's mission to educate future leaders in business, research, and society.
The University of Mannheim promotes outstanding research of individuals and their opera magna as well as outstanding achievements of academic departments and interdisciplinary research projects in collaborative research centers and in the Graduate School of Economic and Social Sciences.

Mannheim Business School and Area Finance

Looking back at more than 100 years of experience in research and education in Business, the Business School of the University of Mannheim has committed itself to the following Mission:
Faculty & Research: As research-focused institution, we are dedicated to produce innovative, internationally visible research with the highest possible impact on scholarship, education, and practice.
Education & Students: As full service provider offering the full spectrum of demanding programs (B.Sc., M.Sc. and Ph.D.), we prepare our students for careers in business and academia, providing them with knowledge and skills. We expose them to intellectual and personal challenges in order to foster their mature and independent personalities.
Academic & Corporate World: As member of a profiled network of academic institutions and corporate partners, we enrich our research and teaching through close interaction between theory and practice, and thus ensure the relevance for business and society.
In all three fields above, we strive for highest possible standards, not only at national but increasingly also at international level.

The Area Banking, Finance, and Insurance is part of the Business School at the University of Mannheim. It has first-class facilities, internationally renowned faculty and conducts research in all areas of finance. Experimental finance is regarded as one of the strengths of the Area.

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Conference Schedule

Wednesday, June 8

Time	Event
09:00-09:40	Bus transfer from Mannheim main station
10:00-10:10	Opening remarks
10:10-11:10	**Keynote 1 - Armin Falk**
11:10-11:30	Break
11:30-12:50	Parallel Session 1a / Parallel Session 1b
12:50-02:00	Lunch
02:00-03:00	Parallel Session 2a / Parallel Session 2b
03:00-03:30	Break
03:30-04:30	Parallel Session 3a / Parallel Session 3b
04:30-05:00	Break
05:00-06:20	**Plenary Session 1**
06:20-06:45	**General Assembly**
7:00	Dinner

Thursday, June 9

Time	Event
09:00-10:20	**Plenary Session 2**
10:20-10:50	Break
10:50-12:10	Parallel Session 4a / Parallel Session 4b
12:10-01:30	Lunch
01:30-02:50	Parallel Session 5a / Parallel Session 5b
02:50-03:20	Break
03:20-04:40	**Plenary Session 3**
05:00-06:00	Hike in the vineyards
7:00	Dinner with wine tasting

Friday, June 10

Time	Event
09:00-10:20	Parallel Session 6a / Parallel Session 6b
10:20-10:45	Break
10:45-11:45	Parallel Session 7a / Parallel Session 7b
11:50-12:50	**Keynote 2 - Terry Odean**
12:50-12:55	Closing remarks
01:00-02:30	Lunch
01:00-01:40	Bus transfer to Mannheim (first bus)
02:30-03:10	Bus transfer to Mannheim (second bus)

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Wednesday, June 8th

10:00	Welcome Opening Remarks

10:10	**The Nature and Predictive Power of Preferences: Global Evidence** **Armin Falk**

Parallel Session 1a 11:30 Expectations in Asset Markets (Chair: B. Kluger)	How Do Markets React to Un(expected) Fundamental Shocks? An Experimental Analysis **Wael Bousselmi** (Discussant: B. Kluger)
	Speculation and Price Indeterminacy in Financial Markets **Thomas Stoeckl** (Discussant: S. Andraszewicz)
	Experimentally Transecting Behavioural Mechanisms Underlying Stock Market Bubbles **Sandra Andraszewicz** (Discussant: W. Bousselmi)
	Implied Volatility and Investor Beliefs in Experimental Asset Markets **Brian Kluger** (Discussant: T. Stoeckl)

Parallel Session 1b 11:30 Investment Decisions (Chair: K. Georgalos)	The Impact of Self-Control on Investment Decisions **Konstantin Lucks** (Discussant: L. Jaroszek)
	Skewness Seeking in a Dynamic Portfolio Choice Experiment **Aleksandar Giga** (Discussant: K. Lucks)
	It's not fear! Emotions may not matter as much as we think in financial markets and financial crises **Theresa Spickers** (Discussant: C. Laudenbach)
	Dynamic Decision Making under Ambiguity: A Portfolio Choice Experiment **Konstantinos Georgalos** (Discussant: A. Giga)

Parallel Session 2a 14:00 Advice, Fees, and Incentives (Chair: P. Reiss)	Naive advice in financial decision making: hidden costs of a free offer **Julia Spreger** (Discussant: P. Reiss)
	High-Frequency Trading and Pricing Structures **David Schindler** (Discussant: J. Spreger)
	Incentive Effects of Funding Contracts: An Experiment **Philipp Reis** (Discussant: D. Schindler)

Parallel Session 2b 14:00 Experimental Design (Chair: O. Powell)	X-Hub: Establishing an infrastructure for multidisciplinary re-use of experimental research data **Claudia Biniossek** (Discussant: O. Powell)
	Ready-to-Use oTree Apps for Risk Preference Elicitation **Felix Holzmeister** (Discussant: C. Biniossek)
	The robustness of mispricing results in experimental asset markets **Owen Powell** (Discussant: F. Holzmeister)

Parallel Session 3a 15:30 Asset Market Experiments (Chair: S. Palan)	Risk preferences and market behavior in call markets **Dirk-Jan Janssen** (Discussant: S. Palan)
	Testing the endowment effect hypothesis in experimental asset markets **Wiebke Szymczak** (Discussant: D.-J. Janssen)
	Is there a premium for socially responsible investments? **Stefan** Palan (Discussant: W. Szymczak)

Parallel Session 3b 15:30 Children, adolescents, and trust (Chair: E. Rantapuska)	Manipulating the Savings Decisions of Children: Experimental Evidence **Moritz Lukas** (Discussant: S. Angel)
	Smart Phones - financially smart adolescents? A randomized controlled trial on the impact of new (and old) media tools on personal finance **Stefan Angel** (Discussant: M. Lukas)
	Trust your gut: Hunger increases trust and trustworthiness **Elias Rantapuska** (Discussant: T. Spickers)

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17:00	**Plenary Session 1** **Individual Decisions and Aggregate Outcomes** (Chair: S. Zeisberger) Financial contagion in the lab: Does network structure matter at all? **Melanie Parravano** (Discussant: S. Zeisberger) Smarter in aggregate: The diversity in financial information processing of professionals compared to that of non-professionals **Hong Qu** (Discussant: N. Hanaki) Social Norms and Strategic Default **Jan Schmitz** (Discussant: M. Parravano) What is risk? Understanding how investors perceive financial risk in return distributions **Stefan Zeisberger** (Discussant: J. Schmitz)
18:20	**General Assembly**

Thursday, June 9th

9:00	**Plenary Session 2** **Replications and Methodology** (Chair: P. Bossaerts) Do lab experiments in economics replicate? **Jürgen Huber** (Discussant: T. Mayrhofer) Same Difference? Thinking About Prices Versus Thinking About Returns in Financial Markets **Zwetelina Iliewa** (Discussant: P. Bossaerts) Exploring the consistency of higher-order risk preferences **Thomas Mayrhofer** (Discussant: Z. Iliewa) How Humans Solve Complex Problems: The Case of The Knapsack Problem **Peter Bossaerts** (Discussant: J. Huber)

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Parallel Session 4a 10:50 Information (Chair: U. Weitzel)	Using feedback to reduce the cost of information intermediation: Experimental evidence **Simone Stæhr** (Discussant: K. Gödker)
	Information display and complexity on experimental asset markets **Wiebke Szymczak** (Discussant: U. Weitzel)
	Trading under the spell of sustainability information: The next bubble to burst? **Katrin Gödker** (Discussant: P. Schreiber)
	Disposition Effect and Market Efficiency **Utz Weitzel** (Discussant: S. Stæhr)

Parallel Session 4b 10:50 Risk (Chair: B. Saltoglu)	Risk attitudes among financial professionals: Measurements and determinants **Florian Lindner** (Discussant: B. Saltoglu)
	Value and Momentum from Investors' Perspective **Christoph Merkle** (Discussant: F. Lindner)
	It's a matter of stress - How emotional Stress Consciously and Subconsciously influences Risk Behavior **Gesa-Kristina Petersen** (Discussant: E. Rantapuska)
	Measures of Individual Risk Attitudes and Portfolio Choice: Evidence from Pension Participants **Burak Saltoglu** (Discussant: G.-K. Petersen)

Parallel Session 5a 13:30 Beliefs (Chair: Y. Lahav)	How Past Performance Framing Impacts Investors' Belief Updating **Patrick Gerhard** (Discussant: P. Jiao)
	Misperception of Exponential Growth: Are People Aware of their Bias? **Henning Cordes** (Discussant: Y. Lahav)
	Experience-Induced Belief Distortion **Peiran Jiao** (Discussant: P. Gerhard)
	Predicting the stock market vs. predicting the weather: differences in elicited beliefs **Yaron Lahav** (Discussant: H. Cordes)

Parallel Session 5b 13:30 Monetary Policy, Banks, and Rating Agencies (Chair: E. Campioni)	The distortionary effect of monetary policy: credit expansion vs lump-sum transfers in the lab **Romain Baeriswyl** (Discussant: E. Campioni)
	An experimental investigation of regulatory sanctions for credit rating agencies **Asri Özgümü** (Discussant: J. P. Rabanal)
	Does competition affect truth-telling? An experiment with rating agencies **Jean Paul Rabanal** (Discussant: A. Özgümüs)
	Financial literacy and bank runs: an experimental analysis **Eloisa Campioni** (Discussant: R. Baeriswyl)

15:20	**Plenary Session 3** **Experimental Markets** (Chair: F. Schneider) On the relation between individual moral decisions and the market outcome **Matthias Stefan** (Discussant: M. Weber) An Experimental Study of Bond Market Pricing **Matthias Weber** (Discussant: F. Schneider) Mental Capabilities and Asset Market Bubbles **Frédéric Schneider** (Discussant: M. Stefan)

Friday, June 10th

Parallel Session 6a 9:00 Efficiency in asset markets (Chair: S. Füllbrunn)	Testing Rational Expectation Formation and the Pricing of Random Earnings Shocks **Philipp Marquardt** (Discussant: S. Füllbrunn)	
	Payout Policy, Investor Rationality, and Market Efficiency: Evidence From Laboratory Experiments **Corina Besliu** (Discussant: P. Marquardt)	
	The Long-Run Effect of Public Forecasts on Information Asymmetry and Price Efficiency: Evidence from a Laboratory Market **Hong Qu** (Discussant: M. Germann)	
	Thar "SHE" blows? Asset market experiments with hidden gender **Sascha Füllbrunn** (Discussant: C. Besliu)	

Parallel Session 6b 9:00 Ambiguity and Uncertainty (Chair: N. Hanaki)	I Want to Know it Now: Measuring Preferences Over the Temporal Resolution of Consumption Uncertainty **Thomas Meissner** (Discussant: C. König-Kersting)
	Testing Theories of Ambiguity Aversion and the Relative Importance of Ambiguity Aversion, Loss Aversion, and Long Shot Preference in Portfolio Choice **King King Li** (Discussant: K. Georgalos)
	Ambiguity Attitudes in Decisions for Others **Christian König-Kersting** (Discussant: K. K. Li)
	Effects of strategic uncertainty on the traders' confidence in their price forecasts **Nobuyuki Hanaki** (Discussant: T. Meissner)

Parallel Session 7a 10:45 Price dynamics in asset markets (Chair: D. Kleinlercher)	Experimental Stock Market Dynamics: Excess demand, adaptation, and style investing in a call-auction with multiple multi-period lived assets **Tibor Neugebauer** (Discussant: M. Kirchler)
	Group Size and Expectation Formation in an Asset Market: a Learning to Forecast Experiment **Anita Kopányi-Peuker** (Discussant: T. Neugebauer)
	Cash Inflow and Speculation Horizon in Asset Markets **Michael Kirchler** (Discussant: A. Kopányi-Peuker)

Parallel Session 7b 10:45 Personality and Gender (Chair: I. Comeig)	Myopic Loss Aversion, Personality and Gender **Robert Durand** (Discussant: I. Comeig)
	Gender differences in choices under financial risk? Salience, Stakes and Probability Effects **Irene Comeig** (Discussant: R. Durand)

11:50	**Experimental Household Finance** **Terry Odean**

12:50	Closing Remarks

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Abstracts

(by name, abstract as provided by the speaker or from the paper)

Andraszewicz, Sandra

Experimentally Transecting Behavioural Mechanisms Underlying Stock Market Bubbles

Andraszewicz, Sandra; Sanadgol, Dorsa; Sornette, Didier; Wu, Ke

Research Question: Can we quantify the prior beliefs of traders and experimentally test the effect of arbitrage and expert information on market price distribution?

Main Result: We demonstrated the applicability of the new experimental design proposed by Sornette et al. (2016) by replicating the stylised facts of their seminal study. Moreover, we observed and quantified the influence of a priori beliefs, of information about arbitrage opportunity and of expert priming on market prices and bubbles formation.

Abstract: "People try to predict the future in many important real-life domains such as economics, finance, politics, weather and climate. Developing principled methods for forecasting and for verifying forecasting skills is very difficult and often meets with failure or disappointment. One of the mechanisms underlying the performance of prediction (and financial) markets is the "wisdom of crowds"" - a phenomenon in which the weak existing information diluted over many individuals may emerge above the large noise by aggregation over the group. Another mechanism is that experts, and even insiders who have special private information, may reveal their knowledge by trading. By design, financial markets are ideal vehicles to elicit these two mechanisms simultaneously. However, examples of market failures abound, in particular in the form of bubbles, crashes and crises.

Standard experimental approaches for researching such dramatic and shocking illustration of mis-pricing and mis-forecasting, namely market bubbles, feature a single asset traded over T periods and assume that underlying security price is known to participants. This assumption is simplistic and detached from reality. Therefore, Sornette et al. (2016) proposed a new paradigm tailored to study coordination in complex social systems, such as financial markets. This new context has features from prediction markets that have been shown previously to mitigate price bubbles in classical asset market experiments: 1) equal endowment and single point dividend payment, 2) small cash-to-asset ratio, 3) market continuously open over six days, 4) order book open to all traders who can freely communicate with each other, 5) large number of securities.

This new paradigm accounts for fundamental uncertainty in complex social systems, such as financial markets and is more realistic as it offers multiple securities that are continuously traded over days and, importantly, there is no "true"" underlying price. Nonetheless, the market is designed such that its rationality can be evaluated. The key findings of Sornette et al. (2016) were that a quick consensus emerges early, yielding pronounced market bubbles. The overpricing diminishes over time, indicating learning, but does not disappear completely. Traders' price estimates become progressively more independent via a collective realization of communal ignorance, pushing the market much closer to rationality, with forecasts that are close to the realized outcomes.

In this paper, we conducted three experiments that employed the paradigm proposed by Sornette et al. (2016). The experiments were a part of a trading exercise for master students attending a "Financial Market Risk" class. 87, 63, 47 students voluntarily participated in experiments 1-3. In each experiment, the students were asked to predict the final slide at which the next class would end, via a prediction market online platform. The uploading of the lecture slides a week before the lecture ensured that all possible outcomes were known to students before trading for the week began. The analysis of the professor's lecturing style demonstrated stochasticity despite some trends. Before the first experiment started, students could observe the professor's lecturing style in four lectures and could participate in two practice trading sessions. Due to a large number of slides uploaded each week, the slides were grouped such that 3 consecutive slides formed one security. Each week was a separate trading session and students' portfolio was reset, but the earnings from each portfolio were recorded at the end of each trading session and added to the overall rank. High rank was compensated with additional credit points that could be used to boost the grade at the final exam of the course.

Experiment 1 lasted four weeks and was a replication of the experiment in Sornette et al. (2016) with an additional feature that, before opening their portfolio, students had to submit their subjective estimate of probabilities that each security will include the finishing slide. To have their portfolio included in the overall rank, students had to repeat this exercise after the market closed, resulting in two measurements of beliefs about the finishing slide. We observed five stylized facts that replicate the results of Sornette et al. (2016): 1) price bubbles appear and become less pronounced over weeks, 2) the number of active traders influencing the market constitutes 12-25% of the market participants, 3) traders have an a-priori belief about the securities' prices and bid accordingly, 4) securities' prices are defined within a few hours after the market opens and stay approximately constant throughout the week notwithstanding sustained trading activity, 5) the market has a high

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predictive power but is not error-free. Additionally, we observe that the distribution of market prices very strongly correlates with the distribution of distribution of student's beliefs at the beginning and at the end of the trading session, which confirms the fact that the group of traders has an a priori belief about the success of each security. In Experiment 2 lasting two weeks, students were instructed to use an arbitrage strategy and were provided with explanations and with three market indices that helped them implement the arbitrage strategy. Introduction of this information resulted in bubble mitigation. In experiment 3 lasting two weeks, we did not provide market indices but instead, in the middle of the week, we distributed "expert information" to half of all students attending the class. Expert information corresponds to one slide that two teaching assistants of the professor honestly agreed on to be the finishing slide, while the professor was agnostic to their decision. In the price distribution during the week, we observe anchoring on the expert information despite the information's imperfect predictive accuracy.

In sum, in this study, we demonstrated the applicability of the new experimental design proposed by Sornette et al. (2016) by replicating the stylised facts of their seminal study. Moreover, we observed and quantified the influence of a priori beliefs, of information about arbitrage opportunity and of expert priming on market prices and bubbles formation."

Angel, Stefan

(Smart)Phones - financially smart adolescents? A randomized controlled trial on the impact of new (and old) media tools on personal finance

Angel, Stefan

Research Question: Is there a causal effect of new media tools like smartphone apps on finance behavior and attitudes among adolescents?

Main Result: Using a budgeting app on the mobile phone did not significantly affect budgeting behavior of the participants over the observation period. However, the screening of the movie showed a (weak) significant impact on our scale of attitudes to-wards debt.

Abstract: "Over time, one can observe an increasing range and complexity of financial products and services on global financial markets. Furthermore, in Austria a growing amount of zero-interest consumer credits and offers with payment by installments in retail commerce (f.i. electronic consumer goods) are observable. Particularly since the 2007 financial crisis it is argued that these developments also demand an increasingly a higher level of financial literacy among individuals in order to make fully informed economic decisions. However, empirical evidence shows that the level of financial literacy in most countries is low. Yet, there is still limited re-search on the impact of different educations programs and measures to increase the level of financial literacy and capabilities, particularly among adolescents. In our paper we want to contribute to the literature on impact evaluations of financial education programs aimed at adolescents.

We use a randomized controlled trial with pre and post measurement in four groups and test for a causal impact of three different treatments on several dependent variables related to financial literacy, attitudes and financial behavior. All variables were measured via an online survey which the participants completed at the university. The questionnaire comprised 75 questions for the pre measurement and 59 questions for the post measurement The items cover several aspects: budgeting, demonstrative consumption, communication about finance, risk preferences, saving attitudes, self-regulation, autonomy and responsibility concerning financial decisions, attitudes towards debt, reflexive consumption and Informed consumer choice. Treatments comprise a) the screening of a documentary movie on over-indebtedness in Austria, b) a web research exercise (where five German financial education websites had to be reviewed by the participants) and c) utilization of a budgeting app on the participants' mobile phones ('Toshl') between pre and post measurement. Due to time and capacity restrictions there were 2 periods of fieldwork. A first round of data collection was done in Vienna/Austria in 2014. A second round lasted from 11/2015 to 02/2016. Our sample comprises around 210 complete pre and post observations for Austrian adolescents between 14 and 21 years of age. The study team was present at all sessions to welcome the participants to the research project and in order to answer questions. The time period between pre and post measurement ranges from 6 to 10 weeks. Participants were financially compensated if both measurements were completed successfully.

Preliminary results show that among the three treatments only the screening of the movie showed a (weak) significant impact on our scale of attitudes towards debt. Those who had seen the movie were more negatively oriented towards making debt than participants in the control group. However, there was no significant effect of this treatment neither on our measures of budgeting behavior, nor on demonstrative consumption, time preference or financial literacy indices. Similar outcomes are observable for the Toshl treatment. To our surprise, using a budgeting app on the mobile phone did not significantly affect budgeting behavior of the participants over the observation period. Finally, there was no clear effect of the website research exercise on any of our outcome variables. Further research and an increased sample size and observation period would be necessary to get a deeper understanding of these effects."

Baeriswyl, Romain

The distortionary effect of monetary policy: credit expansion vs lump-sum transfers in the lab

Baeriswyl, Romain; Cornand, Camille

Research Question: Does the process of monetary injection matter for the real allocative effect of monetary policy?

Main Result: In the experiment, credit expansion leads to substantial distortions of real allocation and relative prices, and exerts a redistributive effect across subjects. By contrast, an increase in money through lump-sum transfers does not distort real allocation.

Abstract: "In an experimental monetary general equilibrium economy, we assess two processes of monetary injection: credit expansion vs. lump-sum monetary transfers. In theory, both processes are neutral and exert no real effect on allocation. In the experiment, however, credit expansion leads to substantial distortions of real allocation and relative prices, and exerts a redistributive effect across subjects. By contrast, an increase in money through lump-sum transfers does not distort real allocation."

Besliu, Corina

Payout Policy, Investor Rationality, and Market Efficiency: Evidence From Laboratory Experiments

Asparouhova, Elena; Besliu, Corina; Lemmon, Michael

Research Question: n.a.

Main Result: n.a.

Abstract: "We use laboratory experiments to examine the longstanding question of whether investors have a preference for particular patterns of firm payouts and whether these preferences are reflected in market prices. We construct a market that closely mimics the conditions underlying the perfect markets conditions outlined in the Miller and Modigliani (1961) famous irrelevance proposition. Despite the absence of meaningful market frictions our evidence suggests that investors do not view \homemade" dividends as perfect substitutes for cash payouts. We find that investors with known consumption needs prefer to fund these needs with certain cash payouts rather than through security sales at potentially unknown prices. Moreover, we find evidence that the preferences for dividend paying securities are also reflected in market prices. The price of the dividend paying security is consistently higher than that of the non-dividend paying one. These pricing discrepancies hold despite the fact that there is little evidence of meaningful market frictions that would limit arbitrage."

Biniossek, Claudia

X-Hub: Establishing an infrastructure for multidisciplinary re-use of experimental research data

Betz, Dirk; Biniossek, Claudia

Research Question: What are the discipline-specific requirements of Experimental Finance regarding research data management?

Main Result: The aim of the presentation is to develop the results in cooperation with the EF-community.

Abstract: "The experimental method is increasingly used in economical science and a significant amount of data is collected. The X-Hub project aims to establish a network of repositories for experimental data from different research disciplines starting with experimental data from experimental economics, behavioral and experimental finance, political science and sociology. Therefore Xresearch (Otto-von-Guericke-University Magdeburg) was integrated into the X-Hub infrastructure in 2015. The first objective is to enable researchers to meet the demands of good scientific practice by sharing their research data (archiving, documentation, publishing). The second objective is to make primary data accessible and understandable for researchers from different scientific communities. Experimental scientists from different disciplines and methodological backgrounds are often interested in the same themes and theories but they use different terminology. X-Hub will enhance interdisciplinary exchange of data and methods, by building both the technical infrastructure and a metadata scheme that allows this understanding from different perspectives."

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Bossaerts, Peter

How Humans Solve Complex Problems: The Case of The Knapsack Problem

Bossaerts, Peter; Murawski, Carsten

Research Question: How do humans solve problems that even Turing machines struggle with yet abound in human life?

Main Result: Complexity as defined for Turing machines is relevant for humans as well; humans work harder on the more difficult problems.

Abstract: "Life presents us with problems of varying complexity. Yet, complexity is not accounted for in theories of human decision-making. Here we study the knapsack problem, a discrete optimisation problem commonly encountered at all levels of cognition, from attention gating to intellectual discovery. We show experimentally that human ability to solve instances of the knapsack problem decreased rapidly with complexity as defined in computer science. Defying traditional economic principles, participants spent effort way beyond the point where marginal gain was positive, and economic performance increased with instance difficulty. Behaviour exhibited signatures of solution algorithms developed for real-world computers, although biological reality—limited working and episodic memories—had noticeable impact. Consistent with the very nature of knapsack problems, only a minority of participants found the solution—often quickly—but the ones who did often seemed not to realise. Substantial heterogeneity emerged, suggesting that prizes and patents, schemes that incentivise intellectual discovery but discourage information sharing, could be improved upon."

Bousselmi, Wael

How Do Markets React to Un(expected) Fundamental Shocks? An Experimental Analysis

Bousselmi, Wael; Sentis, Patrick; Willinger, Marc

Research Question: What is the impact of unexpected/expected fundamental value shocks on prices and turnover?

Main Result: Price bubbles appear in almost all markets, with and without FV shocks. Anticipated shocks affect negatively transactions prices, deflating the price bubble, and negatively trading volumes. These results suggest that FV shocks tend to reduce information asymmetry. Specifically, lower spread between median/mean prices and fundamental value (lower price deviation) and lower turnover with anticipated shocks have been observed. The depression effect on the volume of transactions after a shock is observed whatever the direction (upwards or downwards) and the nature (expected or unexpected) of the shock. Transactions prices tend to over(under)react following a positive(negative) shock. Finally, shocks increase sharply the difference of opinions, but this effect does not affect the volume of transactions.

Abstract: "We rely on experimental asset markets to study the impact of unexpected/expected fundamental value shocks on prices and turnover. We have collected data for a total of 30 markets, 15 markets with constant fundamental value and 15 markets with stochastic fundamental value (8 with upward shocks and 7 with downward shocks). Price bubbles appear in almost all markets, with and without FV shocks. Anticipated shocks affect negatively transactions prices, deflating the price bubble, and negatively trading volumes. These results suggest that FV shocks tend to reduce information asymmetry. Specifically, lower spread between median/mean prices and fundamental value (lower price deviation) and lower turnover with anticipated shocks have been observed. The depression effect on the volume of transactions after a shock is observed whatever the direction (upwards or downwards) and the nature (expected or unexpected) of the shock. Transactions prices tend to over(under)react following a positive(negative) shock. Finally, shocks increase sharply the difference of opinions, but this effect does not affect the volume of transactions."

Campioni, Eloisa

Financial literacy and bank runs: an experimental analysis

Campioni, Eloisa; Larocca, Vittorio; Mirra, Loredana; Panaccione, Luca

Research Question: What are the determinants of bank run equilibria in strategic contexts, in which bank depositors possess financial knowledge?

Main Result: Depositors converge on the bank run equilibrium, the coordination is not immediate but it is faster in larger banks. The analysis on the role of financial literacy is still in progress.

Abstract: "In this research work, we study by means of an experiment the determinants of bank run equilibria in strategic contexts, in which bank depositors possess financial knowledge. From a theoretical perspective, our experimental game mimics the Diamond and Dybvig (1983) model, in which runs result from the fundamental

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coordination problem among bank's depositors. In one of the multiple equilibria of the game, all depositors withdraw according to their liquidity needs, the bank is solvent and the economy achieves a Pareto efficient allocation. In the other equilibrium, depositors anticipate their withdrawals on the belief that every other depositor will withdraw, thus inducing a run on bank's deposits which is associated to an inefficient equilibrium outcome. In line with this approach, our experiment features two Pareto ordered equilibrium outcomes, that are, one of which corresponds to a bank run. The subjects anonymously interact within an experimental bank and take a withdrawal decisions. As a preliminary step of our experiment, we test the financial literacy and the general knowledge of the experimental subjects involved and we use this information as a treatment variable of our study.

In this frame, first we investigate the relationships between individual financial knowledge and individual behaviour for bank's depositor.

Second, using the information from the initial questionnaire, we provide depositors with some statistics on the financial literacy or general knowledge of the group they are interacting with, and test whether this has an effect on the individual withdrawal decision and on the equilibrium outcome of the group.

Finally, we study whether and how the coordination problem within a given bank is sensitive to the dimension of the bank, i.e. whether small, medium or large groups affect the individual withdrawal decision.

Design of the Experiment

The experiment is fully computerized using z-Tree Fischbacher (2007) and conducted in the laboratory of CESARE at Luiss Guido Carli in Rome with student participants recruited by Orsee Greiner (2004). The complete instructions are available upon request.

The experiment consists of nine sessions and each session consists of three phases. In each phase, tasks performed by participants determine payoffs denominated in the experimental currency Zed and converted in Euro at the exchange rate of 20 Zed = 1 Euro.

In Phase 1, participants have to answer 13 multiple choice questions, the odd-numbered with general knowledge content and the even-numbered with financial literacy content. A time limit of 90 seconds is given for answering each question, and participants obtain: 1 point for a correct answer; -0.5 points for a wrong answer, and 0 points for unanswered questions. Participants' choices are incentivized as follows: the score from the questionnaire, ranging from -6.5 to 13, is converted via an affine transformation into the probability of winning the prize of 150 Zed in a binary lottery in which the other prize is 50 Zed. The probability of winning the high price increases with the score, and ranges from 5% if the score is -6.5 to 95% if it is 13. At the end of Phase 1, participants receive information on own total score, separately for even- and odd-numbered questions. The random draw assigning either the high price of 150 Zed or the low price of 50 Zed is postponed until the end of the third and last phase.

In Phase 2, equally sized groups of participants are formed using the random stranger matching protocol. Depending on the session, group size is 5, 7 or 10 participants. In each session, participants' task is replicated for a predetermined number of periods (20 periods in sessions with groups of 5 and of 7 participants, 25 periods in sessions with groups of 10). To avoid repeated-game effects, groups are reshuffled in every period.

At the beginning of each period, group members referred to as ""depositors" of an ""experimental bank" are assigned a deposit worth 100 Zed and their task is to decide whether to withdraw or leave the money deposited. Participants' payoff depends on own and others' choices. At the end of each period, participants receive feedback information on own payoff and number of withdrawals in their own bank. Participants are aware that a single period from this phase will be randomly selected for payment and that this common draw is postponed until the end of the third and last phase.

Finally, in Phase 3 participants' risk aversion is elicited using the Holt and Laury (2002) protocol.

The payment for the experiment is, therefore, the sum of (i) the prize from the (individual) binary lottery associated to Phase 1, (ii) the payoff of the (commonly drawn) period of Phase 2, (iii) the prize from the binary lottery selected from the (commonly drawn) pair of lotteries from Phase 3.

There are three between-subject treatments differing in information provided to participants before deciding on the withdrawal. Each treatment is replicated for all three group sizes, whence the total of nine sessions. In the Financial Info (FI) treatment, participants are communicated the minimum, the maximum and the average score obtained by their fellow depositors in even-numbered questions with financial literacy content; in the General Info (GI) treatment, participants are communicated the same statistics on the score obtained in odd-numbered questions with general knowledge content; finally in the No Info (NI) treatment, no additional information on the score of the questionnaire is disclosed.

Given the characterization of the sessions we are able to investigate the behaviour of participants for any given combination of bank size and information structure, hence we can rely on a solid frame to effectively address our research questions."

Comeig, Irene

Gender differences in choices under financial risk? Salience, Stakes and Probability Effects

Comeig, Irene; Holt, Charles; Jaramillo-Gutiérrez, Ainhoa

Research Question: Are there gender differences in choices under downside and upside financial risk?

Main Result: We find that the same people who avoid risk in the downside setting tend to make more risky choices in the upside one. The experiment is designed to disentangle the probability-weighting and utility-curvature components of risk attitudes, and to differentiate settings in which gender differences arise from those in which they do not. Women are more risk averse for downside risks, but gender differences are diminished for upside risks.

Abstract: "Major economic decisions regarding investments, insurance, or pension plans typically include a "safer" option with low payoff variance, and a "riskier" option with a high spread between best and worst outcomes. Risk preferences over such alternatives may be influenced by a bundle of emotions, motivations, and perceptions, which can vary from person to person, and over time for the same person. Despite this variability, previous research has provided important insights on demographic factors, such as gender, that seem to have persistent effects on risk preferences.   However, different studies of gender differences in risk preferences examine such a variety of risk and payoff structures that is difficult to reconcile conclusions. This paper provides a context-free canonical form experiment, with a range of payoff magnitudes and risk structures e.g. whether there is a small probability of a good outcome or a small probability of a bad outcome. The objective is twofold: (i) to differentiate settings in which gender differences arise from those in which no such effects are observed, and (ii) to help disentangle the probability-weighting and utility-curvature components of risk attitudes.

Previous work, often motivated by insurance or bankruptcy, tends to focus on the downside risk of a very low payoff. The main qualitative patterns in the data highlight the importance of distinguishing between upside and downside risk and between high-stakes and low-stakes decisions:

1) People tend to be more risk averse for downside risk than for upside risk. The same people choose the riskier option about twice as often when it involves upside risk instead of downside risk, even though the expected payoff advantage of the riskier option is the same for all of these decision pairs.

2) A five-fold increase in all payoffs results in a lower incidence of riskier choices for downside risk, but this effect is not present with upside risk.

3) Male subjects exhibit less risk aversion than females in the baseline case of downside risk and payoffs below $10, but this "bravado" goes away with high-stakes downside risk decisions. There is no significant gender difference for upside risk, irrespective of payoff scale.

The distinction between different types of risk, upside versus downside, can be important in understanding apparent instabilities in risk preferences across domains. In models of "directed search," for example, a worker who decides to concentrate efforts on obtaining a high-paid position must keep in mind the possibility that others may also direct their search towards that position. The alternative is to apply for a position with a moderate salary, knowing that more of those positions are available. In equilibrium, the probability of obtaining the high paid job may be somewhat low, but a tendency to overweight that probability may attract search efforts in that direction, more than would be otherwise expected. In particular, people who appear risk averse in terms of insurance and savings decisions may target search in the risky direction of the high paid position."

Cordes, Henning

Misperception of Exponential Growth: Are People Aware of their Bias?

Cordes, Henning; Foltice, Bryan; Langer, Thomas

Research Question: Are people aware of the extent of their exponential growth bias?

Main Result: Sophisticated subjects overestimate the accuracy of their intuitive judgments but are willing to pay a lot for computational support the same time.

Abstract: "Exponential growth bias refers to people's tendency to linearize exponential functions when assessing them intuitively. Empirically, the bias is related to various types of subpar behavior: more-biased households borrow more, save less, favor shorter maturities, and are less likely to invest in risky assets. To inspire policy making it is important to better understand the drivers of the exponential growth bias and the channels through which it influences behavior. In this paper, we explore the interplay of the conceptual and the cognitive component of the bias. The former refers to a general misunderstanding of the conceptual background of exponential growth and the ignorance of the relevant formulas. The latter refers to cognitive limitations that generate a systematic bias in attempts to intuitively judge exponential growth effects. The distinction is important as the value and appreciation of computational aids like a pocket calculator strongly depend on the sources of the bias and individuals' self-awareness of the problem. In an incentivized experiment, we find that participants

are highly overconfident of their ability to provide precise answers to exponentially-based household finance questions when assessing them intuitively (i.e., without the help of a calculator). Interestingly, participants simultaneously reveal a strong preference for utilizing a calculator and thus attenuating the cognitive dimension of the estimation problem. We find evidence that this preference is driven by the participants' distaste for the "ambiguity" of possibly misperceiving exponential growth. We discuss our findings from a policy making perspective and argue that simple interventions on counteracting the exponential growth bias are likely to be fruitful, as people are keen to utilize computational tools."

Durand, Robert

Myopic Loss Aversion, Personality and Gender

Durand, Robert B.; Fung, Lucia; Limkriangkrai, Manapon

Research Question: Why do subjects/investors exhibit differing degrees of myopic loss aversion?

Main Result: Personality traits (from Norman's "Big Five") explain subjects' propensity to exhibit myopic loss aversion.

Abstract: "Purpose and background.

Experiments have demonstrated that subjects exhibit MLA (myopic loss aversion) (Gneezy and Potters, 1997; Haigh and List, 2005): subjects' asymmetric responses to expected losses become more pronounced as investment horizons shorten. Haigh and List (2005) (HL) examine MLA using students and CBOT traders and find that MLA is more pronounced for traders. This is surprising as behavioral biases such as MLA might be expected to become less pronounced with expertise. Studies are silent on why subjects might exhibit differing degrees of MLA.

This paper considers if gender and, or, personality metrics explain the variation in subjects' propensities to exhibit MLA.

Methodology.

We follow the experimental protocol of Gneezy and Potters (1997) (GP) and HL utilizing a 2 x 2 experimental design. We examine 128 subjects (64 female and 64 male) and, for 32 subjects from each gender, apply either one of two treatments. The frequent treatment allowed subjects to make bets in nine rounds. The infrequent treatment was identical save that subjects placed bets for three rounds at a time (in rounds 1, 4 and 7). Subjects received payment based on the outcome of their betting.

We test for differences between treatments and gender. These differences are examined using Mann-Whitney tests. We also utilize Norman's (1963) "Big Five" personality constructs – neuroticism, extraversion, openness to experience, conscientiousness and agreeableness – to examine if subjects' propensity to exhibit MLA is a function of their personality traits differing. These analyses are conducted using panel random effects Tobit estimation.

Findings.

- Subjects exhibit MLA. Our findings confirm those of GP and HL.
- There is prima facie evidence that females display greater MLA than males but only in the frequent treatment.
- The effect of gender is marginal when personality traits are considered. These results are robust when we conduct the analysis using only rounds 1, 4 and 7 (that is, those rounds where subjects undergoing the infrequent treatment make active investment decisions)
- Neuroticism has a negative association with MLA.
- Extraversion has a positive association with MLA.

Contribution.

The literature is silent on the determinants of variation in investors' MLA. We address this gap in the literature.

Two personality traits - neuroticism and extraversion – have statistically significant associations with MLA. Extraversion is associated with reward seeking; it has a positive association with exposure to risk (Durand, Newby, Tant and Trepongkaruna, 2013) Neuroticism has a complex relationship to risk (Durand et al., 2013) and it is related to the disposition effect (Durand, Newby, Peggs and Siekierka, 2012).

Gender has, at best, a marginal association with MLA. Our findings suggest that studies using gender without considering the personality traits of subjects (investors) may be mis-specified and, as such, misleading.

Our results highlight the potential importance of including personality traits in behavioral finance and experimental research."

Füllbrunn, Sascha

Thar "SHE" blows? Asset market experiments with hidden gender

Eckel, Catherine; Füllbrunn, Sascha

Research Question: Do females still bubble differently in exp. asset markets when gender is known?

Main Result: No, within known gender markets bubble quite similar.

Abstract: "Eckel and Füllbrunn (2015) report a striking gender difference in experimental asset markets: Markets with only men produce large, significant price bubbles, while markets with only women do not. This difference could be due to underlying differences in preferences, or differences in beliefs about others, factors that are explored to some extent in the original paper. Beliefs about the market can be shaped by knowledge of the market composition, and a possible explanation for the results might be that common expectations about the behavior of the (known) gender in a market drive the bubble formation. If we take away these common expectations, gender differences might be reduced. Hence, we conduct a new experiment with single-gender markets, but where the gender composition of the market is unknown to the participants. The gender effect almost disappears, providing evidence that common expectations play a role in bubble formation."

Georgalos, Konstantinos

Dynamic Decision Making under Ambiguity: A Portfolio Choice Experiment

Georgalos, Konstantinos

Research Question: How do individuals tackle dynamic portfolio problems under ambiguity? Are they dynamically consistent and if not are they aware of this inconsistency?

Main Result: People with ambiguity non-neutral attitudes violate dynamic consistency. There is extended behavioural heterogeneity regarding preferences and planning strategies.

Abstract:

"1 Introduction

One of the most common assumptions in economic theory when the economic agent has to decide in an ambiguous1 environment, is that she is able to form subjective beliefs for the various possible states of the world and maximise her subjective expected utility (SEU). In addition, when new, partial information is received, these prior beliefs are updated according to the Bayes rule. This requires the satisfaction of two axioms, that of dynamic consistency (DC) which ensures that ex-ante decisions are in line with the ex-post ones and that of consequentialism (C) which means that only the available alternatives matter after the reception of some partial information. Nevertheless, Ellsberg in 1964 suggested some thought experiments that significantly challenged the axioms upon which the SEU theory is built. As a consequence, a bulk of literature emerged, aiming to accommodate behaviour that explains the Ellsberg paradox (see Etner et al. (2012) for a review of the theoretical literature). These models serve quite well decision making in a static framework, but if one is willing to adopt such models as a positive description of human behaviour, these models should be able to account for choice in a dynamic framework. Many extensions have been proposed in the literature, all of which require the relaxation of one of the two fundamental axioms of the SEU model, namely that of DC and C. The direct consequence of this is that the Bayes rule is not any more a suitable updating rule since the simultaneous satisfaction of both axioms is a prerequisite. This resulted to the development of models that relax one of the two axioms and when these model are used to an economic application they produce totally different predictions depending on the assumption they are based on (for a review see Al-Najjar and Weistein (2009)). As a result, if we accept violations of the SEU model, it is crucial to figure out which of the two axioms is satisfied and how do people update their beliefs when they obtain new information. Furthermore, if agents are dynamically inconsistent, it is crucial to understand whether they are aware of this inconsistency or not. In the literature, there are very few experiments discussing these issues (Cohen et al. (2000), Dominiak et al. (2012)) using the traditional Ellsberg urn experiments. The common result of these studies is the extended degree of dynamic inconsistency. As the theoretical literature of choice under ambiguity expands, it is natural to expect that these advances will be applied in the financial economics literature. Epstein and Schneider (2010) and Guidolin and Rinaldi (2013) review the literature in asset pricing and portfolio choice when the agents have non-neutral attitudes towards ambiguity. There are several experimental studies that introduce ambiguity in market or portfolio settings (Bossaerts et al. (2010), Corgnet et al. (2013), Fullbrunn et al. (2014), Ahn et al. (2014)) but very few focus on dynamic settings under ambiguity. On the contrary, more recently, Jeong et al. (2015) and Thimme and Völkert (2015) used market data to fit dynamic versions of ambiguity models. Nevertheless, these studies implicitly assume that the market participants satisfy dynamic consistency. In this study, we test the dynamic consistency hypothesis using a dynamic portfolio choice experiment. We use experimental data to fit a dynamic version of the a-Maxmin model (Ghirardato et al. (2004)) and we test for subject level behavioural heterogeneity depending on whether participants are dynamically inconsistent or not and in case they are inconsistent, whether they are aware of this

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violation or not. We determine three behavioural types (1) the resolute type who satisfies dynamic consistency (2) the naive type who fails to realise the dynamic structure of the problem and (3) the sophisticated type who is dynamically inconsistent but takes this inconsistency into consideration.

2 Methodology and Data

In this paper we use experimental data to estimate models of decision making under ambiguity in a dynamic framework. The experiment includes a two-stage, sequential portfolio allocation task, where the subjects allocate income to three state-contingent Arrow securities. The design is similar in nature to the one applied in Ahn et al. (2014), but modified to its dynamic version and using a transparent, non-manipulable device (a Bingo Blower) to represent ambiguity. The decision task consists of a modified dynamic Ellsberg urn experiment2 extended in such a way that it allows to generate a richer dataset that allows us to simultaneously elicit subjective beliefs, risk and ambiguity attitudes. At time t = 0 a DM is endowed with an experimental income m and is asked to allocate it between the three securities, satisfying the budget constraint given the securities' price vector p. The demand for the assets is a function of the preferences of the DM, the prices and the beliefs of the DM. At t = 1 the nature moves (a ball is drawn from the Bingo Blower) and a state of the world is realised. At this point, the actual state of the world is not yet revealed. Instead, partial information is provided to the agent that some of the states of the world have not been realised (in the particular framework it is announced that one of the states of the world has not happened). The DM is losing the proportion of the income that has been allocated to that state of the world. Then, she is asked to allocate the remaining experimental income to the two available assets based on the agent's preferences, the prices and the now updated beliefs. At t = 2 all ambiguity is resolved, the actual state of the world is revealed and the DM is paid the state-contingent dividend (the amount of Arrow asset holdings that correspond to the realised state of the world). This task is repeated for 60 problems where each problem includes different levels of experimental income and different prices for the three assets.

3 Results

We analyze portfolio choice data from 58 subjects. We make the necessary structural assumptions regarding the utility representation and the stochastic part of the decision process and estimate preference functionals at the subject level. For each of the subjects we fit a SEU specification as a benchmark model and three a-MEU specifications, one for each assumed behavioral type. We obtain individual estimations for the risk aversion parameter, the subjective beliefs, the ambiguity aversion coefficient as well as the precision of the stochastic choice component. We classify our subjects based on a "goodness of fit" significance criterion and control for robustness using the Bayesian posteriors. Assuming ambiguity neutrality for all the subjects, we find that subjects over-estimate low probabilities and under-estimate high probabilities leading to significant deviations from the optimal Bayesian updating that is usually assumed. On the overall, we cannot reject the null hypothesis of SEU for almost half of the subjects (46.6%). When we consider the non-SEU subjects, the majority (51.7%) can be classified as sophisticated, 25.8% naive and only 22.6% as resolute. Focusing on which axiom the ambiguity non-neutral subjects satisfy when they tackle a dynamic portfolio choice, we find that more than 3/4 of the participants (77.4%) satisfy consequentialism and a minority abides to dynamic consistency. By calculating the posterior probabilities for each type, the robustness of the classification is confirmed. Finally, for the subjects with non-neutral ambiguity attitudes, we find that 48.3% of the participants have ambiguity loving attitudes while the rest have ambiguity averse. When we consider the total population, these proportions are 46.6%, 25.9% and 27.6% for the ambiguity neutral, averse and loving DM respectively. We conclude by discussing the effects that this heterogeneity may have in asset markets and inter-temporal portfolio management problems."

Gerhard, Patrick

How Past Performance Framing Impacts Investors' Belief Updating

Gerhard, Patrick; Hoffmann, Arvid; Post, Thomas

Research Question: How does past performance framing impact investors' belief updating?

Main Result: The decision to opt out of the default or not influences the design of default options.

Abstract: "Larger updates in individual investors' beliefs (return expectations and risk perceptions) lead to more active trading, hurting performance. We examine how framing of past performance information (i.e., past returns) affects investors' belief updating. In particular, we analyze whether presenting longer information horizons as a default option leads to smaller updates in beliefs. In two six-round experiments, of which one was executed in a laboratory setting and one in the field, we present a total of 986 subjects with past return information and subsequently measure updates of their beliefs. We employ three different main versions of frames, varying the default information horizon subjects are exposed to (annual, monthly, daily). Different from previous work, we allow subjects to easily opt out of the default to obtain past return information on each of the three information horizons. Such a setting closely resembles investors' actual decision-making environment. We find that in contrast to previous work, presenting returns over a longer information horizon is not necessarily beneficial. Only for subjects staying in their default information horizon, presenting returns over a longer information horizon has a

mitigating effect on the magnitude of their belief updates. For subjects opting out of the default, we find the opposite effect. Especially more financially literate subjects opt out of the default. To ensure comparability with previous research and to identify the effect of opting out of the default, in an additional experiment version subjects are not allowed to opt out of the default return horizon. In line with previous research, we find that in such a restrictive setup which limits subjects' choices, presenting returns over longer horizons decreases belief updating."

Giga, Aleksandar

Skewness Seeking in a Dynamic Portfolio Choice Experiment

Brocas, Isabelle; Carrillo, Juan D.; Giga, Aleksandar; Zapatero, Fernando

Research Question: How pervasive are preferences for skewness in the population and can frequent exposure help individuals realize the low (in our design, negative) expected value of such investment?

Main Result: Preference for skewness is a robust finding, yet a non-negligible fraction of subjects learn to avoid these gambles.

Abstract: "We conduct a controlled laboratory experiment in which subjects dynamically choose to allocate their portfolio between (i) a safe asset, (ii) a risky asset and (iii) a skewed asset with negative expected value (a "bet"), in an environment where they can some- times choose to acquire some information about the performance of their peers. We find three distinct groups of individuals: 16% of subjects never buy the bet, 29% of subjects learn not to buy the bet and 55% subjects persist purchasing the bet throughout the experiment. Among the latter group, purchases are most frequent when subjects are rich and when it is their last opportunity. Our subjects are also interested in the wealth of others, especially relative to theirs. Indeed, a subject with low, medium and high wealth has a preference for finding out what is the minimum, average and maximum wealth in the session, respectively. We also find that subjects buy more bets when they are richer and (unexpectedly) learn that their peers outperform them."

Gödker, Katrin

Trading under the spell of sustainability information: The next bubble to burst?

Bassen, Alexander; Gödker, Katrin

Research Question: Does non-financially framed information in asset markets influences mispricing and bubble formation?

Main Result: Results from a pilot session reveal that there are differences in mispricing and bubble formation between our two frame conditions, whereby overvaluation is larger for markets with non-financially framed information signals. Moreover, we find indication that this induced overvaluation is moderated by cognitive and/or behavioral factors at traders' individual level.

Abstract: "This paper addresses the question whether non-financially framed information in asset markets influence mispricing and bubble formation. More precisely, we study whether signals framed with corporate sustainability information induce mispricing at the individual as well as market level and shed light on how traders' cognitive ability and overconfidence moderate this effect. We answer this question by varying the frame of private signals in the experimental asset market design introduced by Smith, Suchanek, and Williams (1988). Results from pre-testing show that in markets with non-financially framed signals, overvaluation and bubble formation can be observed and are stronger than in markets with financially framed signals. Moreover, there is indication that this induced overvaluation is moderated by traders' cognitive and/or behavioral biases. In times of increasing corporate sustainability disclosure, this finding is of particular importance and adds a new perspective on corporate sustainability in financial markets."

Hanaki, Nobuyuki

Effects of strategic uncertainty on the traders' confidence in their price forecasts

Akiyama, Eizo; Hanaki, Nobuyuki; Ishikawa, Ryuichiro

Research Question: To what extent the presence of strategic uncertainty reduces subjects' confidence in their price forecasts?

Main Result: Our preliminary results show that, surprisingly, eliminating the strategic uncertainty does not significantly increase our subjects' confidence in their price forecasts at least in the beginning (before subjects learn about resulting prices for several periods).

Abstract: "In this paper, we investigate the extent to which presence of strategic uncertainty in experimental asset market reduce the subjects' confidence in their price forecasts. We employ an incentivized interval forecasts elicitation method in 10 periods call asset markets. Six traders interact in a market and there is no uncertainty about the amount of dividend payments. Two treatments are considered: one in which 6 traders are all human subjects (6H), and another in which one human subject interact with five computer traders whose behavior is known (1H5C). Our preliminary experimental result shows that while the deviation of initial price forecasts from the fundamental value is significantly smaller in 1H5C than in 6H, the average confidence on the forecasts is not. We plan to run more experiments and to extend the analyses of data before the conference to present more extensive and conclusive findings."

Holzmeister, Felix

Ready-to-Use oTree Apps for Risk Preference Elicitation

Holzmeister, Felix

Research Question: How to implement risk elicitation tasks in oTree?

Main Result: Ready-to-use oTree modules for four frequently used risk elicitation methods.

Abstract: "Risk is prevalent in numerous domains of economic decision-making. Investigating the implications of individual attitudes towards risk and uncertainty on different facets of economic behavior has been on the agenda of experimental scholars for several decades. A still growing body of literature proposes an extensive set of tools and methods for properly measuring risk attitudes, commonly used in many fields of economic research. This paper presents four ready-to-use oTree applications (Chen et al., 2015) for elicitation methods of risk preferences frequently applied in experimental research in the fields of economics, finance, and social sciences: (i) multiple choice lists between pairs of lotteries with varying probabilities (Hey and Orme, 1994; Holt and Laury, 2002), (ii) multiple decisions between a fixed lottery and varying certain payments (Dohmen et al., 2010; Abdellaoui et al., 2011), (iii) a single choice problem of how much to allocate between a safe and a risky asset framed as an investment decision (Gneezy and Potters, 1997; Charness and Gneezy, 2012), and (iv) the bomb risk elicitation task (Crosetto and Filippin, 2013) and devil's game (Slovic, 1966).

The software modules are programmed as stand-alone oTree apps using Python and the Django web application framework. The apps can be used in any experiment conducted with oTree by copying the app's folder into oTree's Django project directory and adapting the session configurations in oTree's settings.py file. The applications presented here utilize state-of-the-art web programming technologies implying increased flexibility, straightforward setup, implementation and customization without any programming skills, and non-restricted combinations of several variations. Further, as ready-to-use modules, the applications tap the full potential of oTree and, thereby, are qualified to be run on any operating system and any device – be that a smartphone, a tablet, or a desktop computer – in a contemporaneous and graphically appealing manner. Once oTree is installed on a web server, the only requirement for running the tasks is an arbitrary web browser being installed (and Javascript being enabled for the bomb risk elicitation task).

Each of the oTree applications allows to run the respective elicitation method of risk preferences in several different variants or specifications, inspired by different implementations and treatment variations used in previous research. In a user-friendly and straightforward way, predefined and well-documented boolean variables are specified in a separate file at the root of the particular application directory. By setting these variables and task-specific parameters (such as lottery payoffs, probabilities, etc.) the apps are easily customizable to a wide range of requirements and readily applicable in numerous different experimental settings.

All applications are prepared for multi-language support using Django's i18n internationalization routines, i.e. all relevant text passages shown to subjects in any of the views are flagged within the code such that translations to arbitrary languages can be provided via separate translation files. By that means, the same app can be run in any language by simply specifying the language acronym in oTree's settings.py. Step-by-step instructions on how to make use of the translation features are included in the folders for download.

In addition to the oTree apps, each module's folder for download contains some Stata script files. These files allow to process data files created by oTree and to generate variables of interest – such as iterative solutions for risk aversion coefficients associated with standard CRRA power utility functions, for instance – according to the specification and parameterization of the task that was applied. Separate .do-files for the calibration of the task prior to conducting the experiments – depending on the number of choices, lottery payoffs, and probabilities – are provided."

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Huber, Jürgen

Do lab experiments in economics replicate?

Camerer, Dreber, Forsell, Ho, Huber, Johannesson, Kirchler, Almenberg, Altmejd, Chan, Heikensten, Holzmeister, Imai, Isaksson, Nave, Pfeiffer, Razen, Wu

Research Question: Do lab experiments in economics replicate?

Main Result: In a systematic replication project of experimental studies published in high impact economics journals 61% replicated, compared to a 36% replication rate in a recent replication project in psychology.

Abstract: "We replicate 18 laboratory experimental studies published in two high-impact economics journals in 2011-2014. All replications have a statistical power of at least 90% to detect the original effect size at the 5% significance level. We find a significant effect in the same direction as in the original study for 11 replications (61%), and on average the replicated effect size is 66% of the original effect size. The reproducibility rate varies between 67% and 78% for four additional reproducibility indicators, including a prediction market measure of peer beliefs. The rate of reproducibility is higher than in a recent replication project in psychology."

Iliewa, Zwetelina

Same Difference? Thinking About Prices Versus Thinking About Returns in Financial Markets

Glaser, Markus; Iliewa, Zwetelina; Weber, Martin

Research Question: n.a.

Main Result: n.a.

Abstract: "Prices and returns are considered interchangeable ways to present financial market information and to elicit financial market expectations in surveys. But do investors make sense of past prices and past returns in the same way? And do they state the same expectations when asked to forecast prices and to forecast returns? This paper compares the two formats with subjects of varying expertise, with different amount of information and with different incentives schemes. The results are consistent across all conditions: Asking subjects to forecast returns as opposed to price levels results in higher expectations, whereas showing subjects return bar charts as opposed to price level line charts results in lower expectations. This paper unveils how the question format and the information presentation format affect investors' process of expectation formation."

Janssen, Dirk-Jan

Risk preferences and market behavior in call markets

Fülbrunn, Sascha; Janssen, Dirk-Jan

Research Question: How do risk attitudes affect market behavior in call markets?

Main Result: We find little effect of risk attitudes on prices, volatility and bids and asks. However trading quantities are lower the more risk averse a market is.

Abstract: "Judging by the number of theories in which in which risk aversion is involved, the concept is arguably one the most important within economics and finance playing a pivotal role in areas ranging from bidding behavior (Cox et al., 1982) to portfolio theory (Markowitz, 1952); interestingly most theories in finance use risk neutrality as well but neglect risk seeking behavior. The prominence of risk attitudes within this literature is hardly surprising given most economic and financial decisions, like so many others, involve uncertain state of the world in the future and thereby risk. Although the question of what determines an individual's risk attitude does not have a clear-cut answer, this has not hampered the development of theoretical models linking risk attitudes to economic financial outcomes. In the case of asset markets specifically, theory predicts that higher risk aversion should lead to lower (higher) bids (asks) and higher price volatility (Shiller, 1980; LeRoy and LaCivita, 1981).

With individual risk attitudes playing such a prominent role in market behavior and outcomes, it is surprising to notice that the effect of individual risk aversion on market behavior is relatively understudied. Even though experimental methods seem especially suited for this kind of research (direct control over such variables as the asset's fundamental value, variability and dividend payments), only a handful of experimental papers has thus far examined the link between individual risk attitudes – and thus the distribution of risk attitudes in a market – and market behavior.

A first noticeable exception is Ang and Schwarz (1985). They experimentally study the effect of risk preferences on market prices, price volatility and efficiency in a double auction context. Using a questionnaire they split the subject pool in risk averse and risk seeking participants and compose two double auction markets accordingly under different information regimes (either no, imperfect or perfect insider information). It is found that, contrary to

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the theoretical prediction of Shiller (1980) and LeRoy and LaCivita (1981), in the risk averse market participants exhibit smaller within-period price volatility than in the risk seeking markets; the number of observations is quite low though. Ang and Schwarz (1985) furthermore find that trading volumes between the two markets do not differ while, as expected, the risk premium is 30% higher for the risk averse market. Market efficiency is found to be higher in the risk seeking market as prices are closer to equilibrium and more assets end up with those traders that value them the highest. A second exception is formed by Fellner and Maciejovsky (2007) who find that individual risk aversion – elicited ex post – is a strong predictor of market activity in the 26 double auction markets used. Specifically, they find that the lower the individual risk aversion of a market participant, the more bids, asks as well as trades he or she makes.

Considering the small number of experimental papers looking into the role of risk attitudes on market behavior we aim to further uncover this relationship experimentally using a call market setting. We do so by following Ang and Schwarz (1985) in composing experimental call markets filled with participants that differ with respect to their individual risk attitudes. Specifically, we run four sessions consisting of three markets with eight traders each with either low (LRA), middle (MRA) or high (HRA) risk averse individuals, where the degree of risk aversion is measured using the Bomb Risk Elicitation Task (BRET) introduced by Crosetto and Filippin (2013). Earlier studies show that market composition might have a significant impact on market performance (propensity to speculate in Janssen, Weitzel, and Füllbrunn (2015), gender in Eckel and Füllbrunn (2015). In particular, Füllbrunn, Janssen, and Weitzel (2016) show that the distribution of risk has a significant impact on overbidding in first price sealed bid auctions.

Each market runs for twelve periods while stocks have a lifetime of only one period meaning that the initial endowments are reinstated at the beginning of each period. Shares pay a dividend which is either high or low. We expect prices in HRA to be closer to risk neutral prices or even higher. We at least expect prices in HRA to be higher than prices in LRA. However, we find no significant difference. Specifically, we find little to no influence of risk preferences on either bids or asks prices, price volatility, bid-ask spreads or the ask quantity. In line with Fellner and Maciejovsky (2007) we do however find a slight negative relationship between the bid quantity and the level of risk aversion present in a market. We contend that our lack of results in comparison to earlier papers might be due to the institution used (call market vs. double auction) in which the level of risk aversion present in a market is not reflected in within-period prices. The lack of such within period signals might make the risk preferences less salient in our call markets than in double auction markets used in earlier studies. We discuss experimental designs to carve out the role of the market institutions and beliefs."

Jiao, Peiran

Experience-Induced Belief Distortion

Jiao, Peiran

Research Question: Are beliefs about a stock biased by the decision makers' past experience on the stock?

Main Result: Subjects were more optimistic (pessimistic) on assets from which they gained (lost). The size of the bias is increasing in the cumulative gains/losses.

Abstract: "The effect of experienced gain/loss on subsequent choices is central to sequential decision-making under uncertainty in various contexts, such as portfolio choice, consumption-saving problems, repeated games, etc. Conventional economic theories assume that agents are endowed with stable risk preferences and the ability to update beliefs following the Bayes' rule, whereas neither is disturbed by personal experience. Departure from this assumption was evident in reinforcement learning (e.g. Suppes and Atkinson, 1960; Erev and Roth, 1998), when people overweight past experience even in changing environments (e.g. Camerer and Ho, 1999). For the mechanism underlying the effects of experience, economists mostly adopt the preference approach, looking into risk attitude shifts following gains/losses (e.g. Thaler and Johnson, 1990; Liu et al. 2010). However, little is known about whether and how beliefs can be distorted by experience. This paper contributes to this literature by combining experience-based learning with belief updating, and using an experiment that exogenously manipulates experience to demonstrate the belief biases induced.

Another motivation arises from a long tradition in psychological studies on the role of experience without delving into the underlying mechanism, preference or belief. This literature started with the hungry cat experiment of \cite{thorndike1898}, which established the law of effect or reinforcement learning, a positive relationship between past rewards on an action and the probability of that action being taken again. Empirical finance evidence suggests individual investors increase their demand for IPO auctions (Kaustia and Knupfer, 2008), 401(k) allocation (Choi et al. 2009) and common stocks (Strahilevitz et al. 2011) after profitable experience. These are supportive of reinforcement learning, yet without investigating potential changes in preferences or beliefs.

Neuroeconomics evidence suggests that both preferences and beliefs can change after gains/losses. Knutson et al. (2008) demonstrate the potential causal link by exogenously stimulating the NAcc, a brain region for positive emotions and reward processing (Breiter et al. 2001), whose activation predicted riskier choices subsequently.

Kuhnen and Knutson (2011) further demonstrate the potential belief changes.

The present paper proposes a mechanism for the effect of experienced gains/losses on subsequent beliefs, closely related to confirmation bias (e.g. Nickerson, 1998), a tendency to collect (ignore) evidence confirming (disconfirming) one's prior. Rabin and Schrag (1999) build a signal extraction model to capture this bias, assuming that agents misinterpret signals disconfirming their prior. The mechanism proposed here is that prior positive (negative) experience will make people likely to misinterpret bad (good) signals into good (bad) ones, and thus overestimate the probability of a good (bad) state, even if they are Bayesian otherwise. The probability of misinterpreting disconfirming signals is increasing in the size of reinforcements received.

To test the model, we ran an experiment with 2 stages; 30 rounds per stage. Stage 1 was Price Prediction, where participants viewed price sequences of stocks for 80 periods, making predictions of the 100th-period price after both Period 20 and 80. The price sequences were adapted from real NYSE stocks. The belief elicitation procedure adopted the exchangeability method (e.g. Baillon, 2008), and subjects earned Prediction Rewards.

Before observing prices of a stock, each subject received some cash endowment. According to the additional share endowment, subjects were randomly assigned to four treatments, namely EL-Large, EL-Small, ES-Large and NoE, where E stands for share endowments and NoE for no share endowment. Large and Small refer to the number of endowed shares: 20 or 10. The endowed shares are automatically sold after Period 20, with any gain/loss added to their account as Capital Reward, so after that participants had no stake in the stocks when making predictions.

Experience was exogenously manipulated by whether the endowment was a long (EL) or short position (ES). To avoid confusion, participants were just told they benefited from price increases or decreases. The purpose of this is to allow participants in all treatments to view exactly the same outcome sequences, which theoretically should lead to the same beliefs, while some gain and others lose. Another important design choice was that although participants in condition NoE had no share endowment, they did receive extra cash endowments matching those Capital Reward earned by the EL-Large group on each stock. This avoids any confound due to wealth effect.

Stage 2, Ball Prediction, was similar to Stage 1, but subjects faced ball drawings from two equally-likely urns with different known proportions of P-balls and Q-balls which had different but similar colors. In the first 5 draws, EL treatment subjects benefited from P-balls drawn and lost from Q-balls, whereas the opposite was true for ES subjects. Their task was to predict the 14th draw after the 5th and 13th draws. In this stage, subjects had enough information to do Bayesian updating, which enabled us to test size of the bias relative to Bayesian.

Preliminary results from pilot sessions were consistent with predictions of the model: participants who gained (lost) from a specific sequence were more optimistic (pessimistic) about the sequence; larger gains/losses were associated with larger biases in general. Since confidence intervals were also elicited, further tests will reveal the relationship between the bias and overconfidence. We will also use the data to calibrate the model and estimate the probability of misinterpreting signals disconfirming one's experience.

The results from this experiment highlight the importance of incorporating experience-based learning in economic models of individual sequential decisions, and point out a potential mechanism for the effects of experience, which is through biasing agents' beliefs. These results have broad implications for investment decisions in finance. A better understanding of beliefs can inform better policy interventions in monetary policies, individual investor education, financial regulation, etc., because many policies target beliefs of the decision makers."

Kirchler, Michael

Cash Inflow and Speculation Horizon in Asset Markets

Huber, Jürgen; Kirchler, Michael; Razen, Michael

Research Question: We investigate the joint effect of cash inflow and speculation horizon on price efficiency.

Main Result: We show that only markets with cash inflow and long speculation horizon exhibit bubbles and crashes. We also observe that markets with extended speculation horizon but without cash inflow and markets with shorter speculation horizon do not trigger bubbles.

Abstract: "It is conjectured that one of the major ingredients of historic financial bubbles was the inflow of money in various forms. We run 36 laboratory asset markets and investigate the joint effect of cash inflow and speculation horizon on price efficiency. We show that only markets with cash inflow and long speculation horizon exhibit bubbles and crashes. We also observe that markets with extended speculation horizon but without cash inflow and markets with shorter speculation horizon do not trigger bubbles. Finally, we report that beliefs about prices and, importantly, also about (constant) fundamentals follow bubble patterns as well."

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Kluger, Brian

Implied Volatility and Investor Beliefs in Experimental Asset Markets

Ackert, Lucy; Kluger, Brian; Li, Qi

Research Question: n.a.

Main Result: n.a.

Abstract: "Prominent investor Sir John Templeton argued that markets are driven by investors' positive and negative expectations of the future. Because markets move with investor beliefs, there is interest in measuring the investing public's view (Barberis, Shleifer, and Vishny (1998)). One measure of forward-looking expectations is the Chicago Board Options Exchange's (CBOE) volatility index (VIX) index, commonly referred to as the "investor fear gauge." The VIX reflects investors' expectations of future market volatility as expressed through trade (Whaley (2000), (2009)). This paper examines how investors' views are related to implied volatility using an experimental method.

Market volatility is of great concern to policymakers, academics, and practitioners alike. Volatility implied by traded option prices has become a standard measure of expectations of future uncertainty. Since the introduction of VIX in 1993, researchers have examined how implied volatilities have changed over time and whether, in fact, the fear gauge is informative about the future. We examine whether investor beliefs are related to implied volatility in experimental asset markets. To accomplish this we design an experiment in which subjects simultaneously trade in markets for a laboratory asset and a call option written on the asset.

The experimental market is simplified, with only two possible outcomes in any period. We vary the range, that is, the distance between the possible outcomes. In some markets, the range is publicly announced, but in others the range is left ambiguous. When the range is ambiguous, we elicit subjects' opinions concerning the unannounced range parameter. Our experiments test to see whether the implied range, calculated from the stock and call prices, is related to the publicly announced range, and, when the range is ambiguous, whether implied range is related to the subjects' beliefs about the range. In both cases, we find that the implied range is informative. Knowledge of the implied range informs an observer about market participants' beliefs concerning volatility.

We also study whether the implied range is related to investor optimism and or overconfidence. To measure of subjects' optimism we use the revised Life Orientation Test (LOT-R) as described by Carver, Scheier, and Segerstrom (2010). This simple survey measures individual subjects' overall level of optimism and pessimism and has been used by psychologists in numerous studies. We also measure overconfidence, using a method suggested by Michailova and Katter (2014). Their miscalibration measure is based on subjects' responses to surveys containing trivia questions. Although we do find that implied range tracks subjects' belief, we fail to find a correspondence between implied range and either optimism or overconfidence in our experiments."

König-Kersting, Christian

Ambiguity Attitudes in Decisions for Others

König-Kersting, Christian; Trautmann, Stefan T.

Research Question: Do people become more or less ambiguity averse when making decisions for others compared to deciding for themselves?

Main Result: We find significantly less ambiguity aversion when choices are made for somebody else, rather than for oneself.

Abstract: "Recent findings in decision making under risk show marked differences between making decisions for oneself and deciding for others (e.g., discussed in Füllbrunn and Luhan, 2015, Am I My Peer's Keeper? Social Responsibility in Financial Decision Making, working paper, Nijmegen). Experimental participants deciding for somebody else exhibit a different degree of risk aversion than those deciding for themselves. Some studies suggest that accountability of the decision maker for her decisions as an agent mitigates this effect. The current study builds on research on risky decisions for other people, but acknowledges that real-world decisions under uncertainty are often characterized by a lack of knowledge about the probabilities attached to the respective outcomes. In contrast to decisions under risk (where probabilities are known), these decisions are commonly referred to as decisions involving ambiguity. In this research project, we ask the question whether the above-discussed findings for risky decisions for others hold true also in decisions involving ambiguity. More precisely, we ask whether (1) people become more or less ambiguity averse when making decisions for others compared to deciding for themselves; and whether (2) accountability is a moderating factor of this effect. We study these questions in a laboratory experiment.

Evidence suggests that decisions under uncertainty are best described by a fourfold pattern of ambiguity attitudes, with ambiguity aversion for moderate probability gains and low probability losses, and ambiguity neutrality or even seeking behavior for moderate probability losses and low probability gains (e.g., Trautmann and van de Kuilen, 2016, Blackwell Handbook of Judgment and Decision Making, Chapter 3).

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We focus on the gain domain, and study the effects of decision making for others both for low probability prospects and for moderate probability prospects. The experiment consists of three treatment conditions in a between-subject design. In treatment SELF, participants take the decisions for themselves, i.e. they make the decision and receive the realization of the prospect. In treatment OTHER, half of the participants act as decision makers while the other half acts as recipients. Recipients receive the payoff that results from the decision makers' choices. In treatment REWARD we introduce an accountability condition to the OTHER setting. Decision makers know that their recipient has the opportunity to express her content with the decision by paying a reward after the uncertainty has been resolved.

In all treatments, participants make decisions on either low or moderate probability lotteries. In each treatment, participants face seven decision situations in which they are asked to indicate their preference for a risky or an ambiguous prospect. One of these decisions and its subsequent outcome is later randomly selected to be payoff relevant (for the decision maker or another participant, depending on the condition). While the ambiguous prospect is the same in each decision, we systematically vary the probability of winning in the risky prospect. Observing a switching point within the seven decisions from the ambiguous to the risky prospect allows us to calculate an individual's probability equivalent for the ambiguous prospect in the respective domain.

We set out to study whether ambiguity attitudes are affected by agency situations and if so, how they change. Quite surprisingly, participants' ambiguity attitudes are unaffected by the agency setting, which stands in stark contrast to the results reported for risk attitudes with known probability. In our experiment, participants show equally pronounced attitudes in the agency setting as in decisions for their own account. We infer that ambiguity attitudes are more robust than risk attitudes with regard to social interactions and normatively acting peer effects. In line with recent studies, we find that ambiguity attitudes depend strongly on the likelihood range considered. Despite the fact that our elicitation method differed from previous experiments and that decisions are made for others in some conditions, we replicate the fourfold pattern of ambiguity attitudes in the gain domain. The result supports the external validity of the pattern of ambiguity attitudes."

Kopányi-Peuker, Anita

Group Size and Expectation Formation in an Asset Market: a Learning to Forecast Experiment

Hommes, Cars; Kopányi-Peuker, Anita; Sonnemans, Joep

Research Question: Is the price dynamics more stable in a larger asset market?

Main Result: We expect to observe more stable behavior in a larger group than in the small groups.

Abstract: "In many market situations expectations play an important role. Agents form their expectations about future prices, and they act according to these expectations: they buy or sell assets. These actions will then determine the actual price in the market.

This research experimentally investigates how price expectations are formed in a large asset market by adapting a "learning to forecast" experiment. Subjects are forecasters of pension funds, and their only task is to forecast the future price of a risky asset. The setup is closely related to Hommes et al. (2008). Participants have relevant qualitative, but not quantitative information about the market characteristics. In particular, they know that the higher the average expectation is, the higher the corresponding market price is ceteris paribus (there is positive feedback on the market). However, they do not know the exact law of motion, and they do not know other group members[1] forecasts.

We contribute to the existing literature in two important aspects. First, we increase external validity of the "learning to forecast" experiments by having large groups forming one market: in the Large treatment, about 100 subjects form a market compared to the Small treatment where only 6 subjects are in one market (standard in previous literature). Second, we introduce newsletter to drive back prices towards the fundamental. In particular, if the price is very far from the fundamental, then subjects receive news about the state of the market with a known probability.

In the experiment we see both stable markets and large bubbles for both small and large markets. A first, preliminary analysis shows no differences between markets considering group size. In some markets news successfully drive prices back towards the fundamental, but we observe very large bubbles in which the news have no effect. Both patterns are observed for both group sizes.."

Lahav, Yaron

Predicting the stock market vs. predicting the weather: differences in elicited beliefs

Lahav, Yaron

Research Question: Are subjects affected by the type of information they are predicting when asked to elicit beliefs, and are they affected by the scoring rule?

Main Result: Subjects tend to provide more extreme beliefs when predicting stock returns, compared to daily temperature. Also, the type of scoring rule has almost no effect on elicited beliefs.

Abstract: "In a set of six lab experiments, subjects were asked to predict 50 future trends of two indices. The first index is daily returns of a certain stock, and the second index is the daily temperature in a certain geographic location.

A total of 122 undergraduate students participated in the experiments. The main purpose of the study is the effect of different indices and scoring rules on subjects' elicited beliefs. The experimental design included six treatments. Each treatment included two stages. Each stage included a forecasting task, where each subject first observed 30 days of the index, and then asked to predict the index trend of each of the next 50 days. The prediction took place in the form of providing probabilistic beliefs for each possible outcome of each day – either positive change, negative change or no change. For each prediction, the outcome of the previous period was added to the information that the subject could observe prior to predicting the next period.

The compensation was calculated using either a quadratic or linear scoring rule. The two scoring rules were explained to the subjects at the beginning of the experiment, but the type of the scoring rule that was actually used was introduced to the subjects only at the beginning of each stage.

Treatments varied by the order of the indices (either stock followed by temperature or temperature followed by stock), and by the use of two different scoring rules (linear and quadratic). The trends of the two indices were identical.

The research objectives are: 1) to test the ability of subjects to detect similarity in trends of two indices, 2) to test the effect of index type on human beliefs, and 3) to test the effect of different scoring rules on belief elicitation.

Findings show that first, although the two indices have identical trends, subjects failed to observe it. Beliefs were consistently different between the two stages, even when controlling for experience. Second, although the trend was identical in the two indices, subjects tend to provide more extreme beliefs when predicting stock returns, compared to daily temperature. Lastly, inconsistent with the theory on scoring rules (and with several previous papers), the type of scoring rule has almost no effect on elicited beliefs, which suggests that the linear scoring rule, while theoretically improper, can still be used in experiments to elicit beliefs."

Li, King King

Testing Theories of Ambiguity Aversion and the Relative Importance of Ambiguity Aversion, Loss Aversion, and Long Shot Preference in Portfolio Choice

Li, King King

Research Question: Why are individuals ambiguity averse, and what is the relative importance of ambiguity aversion, loss aversion, and long shot preference in portfolio choice?

Main Result: Long shot preference and loss aversion play a more dominant role in portfolio choice than ambiguity aversion.

Abstract: "The objective of this paper is to experimentally test competing theories of ambiguity aversion, and the robustness of ambiguity aversion to small changes in the experimental design.

Our experiment is designed in a way such that we can discriminate between alpha-maxmin theory (Gilboa and Schmeidler, 1989) of ambiguity aversion, smooth ambiguity aversion (Klibanoff, Marinacci, and Mukerji, 2005, KMM, hereafter), and ambiguity aversion due to preference on reduction of compound lotteries (Segal, 1987; Segal, 1990).

One contribution of our experiment is that it helps to resolve a recent debate between Epstein (2010), Klibanoff, Marinacci, and Mukerji (2005) on the whether the smooth ambiguity model is a better theory on ambiguity aversion than the multiple priors model (Gilboa and Schmeidler, 1989). Epstein (2010) uses a thought experiment to present paradoxes of the smooth ambiguity aversion. In particular, Epstein (2010) points that the smooth ambiguity aversion model will predict that the decision maker will exhibit strict preference for randomization, which may not be well supported empirically. The argument will imply that smooth ambiguity aversion model predicts that decision maker will exhibit strict preference for randomization on the two ambiguity lotteries.

In a reply to Epstein's critique, KMM (2009b) offered that the mixture if strictly preferable because it reduces the variation in expected utilities across possible probability laws. In response to this point, Epstein (2010) wrote "this argument for the value of randomization would seem to reflect nonreduction of compound lotteries rather than

ambiguity aversion. Nevertheless, the descriptive validity of (*) (i.e., individuals exhibit strict preference for randomization between two ambiguity lotteries) is an empirical question."

In other words, whether the smooth ambiguity aversion model is a better model will depend on whether there is a correlation between ambiguity aversion and preference for randomization of ambiguity lotteries. That is, whether ambiguity averse subjects are more likely to exhibit such preference than non-ambiguity averse subjects. As mentioned by Epstein (2010), this is an empirical question. Our paper aims at answering this question experimentally.

Our study is not the first attempt on using experiment to resolve the above debate. Cubitt, Kuilen, and Mukerji (2014) conduct experiments to answer the question, and found support for the smooth ambiguity aversion model. However, in their design subjects are free to choose for the randomize lottery, which one may argue that may not be a good design to identify strong preference for randomization. That is, if the preference for randomization can be easily changed by introducing a small fee for using the randomized lottery, then the preference may not be robust. Our study differs from their study in that we use a design that test whether preference for randomization is robust to small fee, where the decision maker needs to pay a small fee to randomize. Indeed, we show that for many decision makers the preference is not robust to a small fee. Another important difference is that our experiment aims at discriminating a set of theories on ambiguity aversion, while their paper is mainly on whether ambiguity averse decision makers exhibit preference for randomization.

Another innovation of our experiment is that we use a set of experiments to identify the ambiguity aversion attitude of the subjects. In the experiment, subjects make several choices where their ambiguity aversion attitude is elicited. The distinctive feature of this design is that it offers a better identification of ambiguity aversion. In the experiment, subject's ambiguity aversion is elicited multiple times under different settings. The settings are designed to invest the following questions:

1. Robustness of ambiguity aversion to complexity.

2. The relationship between preference on reduction of compound lotteries and ambiguity aversion.

3. Robustness of ambiguity aversion to long shot preference.

4. The relationship between ambiguity aversion and portfolio choice.

5. The relative impact of ambiguity aversion, long shot preference, and loss aversion on choice under uncertainty.

The main findings of our experiment are as follows. Our first finding concerns the Epstein (2010)'s criticism on smooth ambiguity model. In contrast to the prediction of the smooth ambiguity model, we found that ambiguity aversion are not more likely to exhibit preference for randomization. Moreover, the preference for randomization in ambiguous lotteries is not robust to small fees. Hence, the smooth ambiguity model (Klibanoff et al., 2005) is not well supported in this regard.

Second, ambiguity aversion is robust to complexity. We show that ambiguity aversion premium increases with the complexity of the context. Third, ambiguity aversion is not robust to addition of big payoff possibility, i.e., long shot preference. Four, ambiguity aversion is not correlated with preference on reduction of compound lottery. Hence, we do not found support for the theory of ambiguity aversion based on preference on reduction of compound lotteries (Segal, 1987; Segal, 1990). Further, we found that preference on compound lottery is not due to misunderstanding of lottery probability. More interestingly, ambiguity aversion also do not seem to correlate with probability sophistication. Five, ambiguity aversion, long shot preference, and loss aversion are correlated with portfolio choice, while loss aversion and long shot preference plays a much more important role. Overall, the alpha-maximin model is more supported than other models."

Lindner, Florian

Risk attitudes among financial professionals: Measurements and determinants

Kirchler, Michael; Lindner, Florian; Weitzel, Utz

Research Question: How financial professionals respond to different risk measurements and whether these responses and their risk preferences differ to student subjects, and which background variables have a significant impact on risk attitudes of financial professionals?

Main Result: Financial professionals show higher risk and loss tolerance compared to student subjects.

Abstract: "Excessive risk-taking among financial professionals has been claimed as one of the major drivers during the financial crises. Although this claim is very prominent there is very little known about professionals' risk preferences and their attitudes towards losses. In this paper we narrow this gap and study risk attitudes among a unique subject pool of more than 400 financial professionals using lottery experiments for measuring risk aversion and loss aversion, the bomb risk elicitation task (BRET), the investment task proposed by Gneezy and Potters (1997), and survey questions from the SOEP. Our contributions is twofold: a) we try to answer the question how financial professionals respond to different risk measurements and whether these responses and their risk preferences differ to student subjects, and b) which background variables have an significant impact on

risk attitudes of financial professionals. For this, we relate the behavioral responses with age, gender, CRT scores, Big-5, Dark-Triad, and other demographic variables and compare different risk elicitation methods within our sample and with student subjects. Results show that financial professionals take more risks in the gain domain as well as they are less averse to losses compared to standard student subjects, which is also seen in non-incentivized questions about the willingness to take risks "in general". Furthermore, we observe more risk tolerance of male professionals in the survey questions on risk-taking, but we do not find gender differences in the lottery task. Another finding suggests that self-reported overconfidence is positive related with more risk tolerance in most of the elicitation methods. Personal characteristics, like the Big-5 or the Dark Triad, seem to play not a major role when it comes to risk taking in lottery tasks. Nevertheless, conscientiousness and neuroticism are negative related to self-reported willingness to take risks."

Lucks, Konstantin

The Impact of Self-Control on Investment Decisions

Lucks, Konstantin

Research Question: Does reduced self-control result in an increased disposition effect and in an increase in myopic loss aversion?

Main Result: There are no main effects, but some findings regarding secondary behavior.

Abstract: "I explore how reduced self-control affects individual investment behavior in two laboratory tasks. For this purpose I exogenously reduce subjects' self-control using a well-established psychological treatment. In each task, I find no significant main treatment effect, but secondary effects which are consistent with self-control's relevance in financial markets. In experiment 1, I find no significant change in the disposition effect following the manipulation. However, treated participants concentrate on trading fewer different shares per round. In experiment 2, I look at the effect of self-control on myopic loss aversion by implementing a 2×2 design varying investment horizon and self-control in a repeated lottery environment. While the results seem to confirm lowered self-control reinforcing framing effects, I cannot reject the null hypothesis of equal investment levels between the self-control treatments within each investment frame. Furthermore, according to the dynamics of decision making, investment experiences drive behavior of treated participants more strongly."

Lukas, Moritz

Manipulating the Savings Decisions of Children: Experimental Evidence

Lukas, Moritz; Nöth, Markus

Research Question: How can children's savings decisions be influenced?

Main Result: Children's savings decisions are influenced by interest rates, time horizons, and default settings.

Abstract: "Based on an experiment conducted in an elementary school, we investigate the influence of varying interest rates, time horizons, and default settings on the savings decisions of children. Our first result shows that lower interest rates on savings, a longer time until the savings can be accessed, and an opt-in framing of savings make children more likely to consume one or more out of ten items immediately instead of saving them. Second, the number of items chosen for immediate consumption increases with a longer time horizon. In addition to our main results, we find that children at higher grade levels are more patient than children in lower grades. Due to the potential long-term implications of childhood patience, our results have important implications for policymakers and financial institutions."

Marquardt, Philipp

Testing Rational Expectation Formation and the Pricing of Random Earnings Shocks

Marquardt, Philipp; Noussair, Charles; Weber, Martin

Research Question: Relationship between cognitive ability and rational expectation formation in a novel market design.

Main Result: Individuals with higher cognitive ability rationally form expectations based on backward induction, whereas individuals with lower cognitive ability rather extrapolate previous price trends. Markets with higher cohort levels of cognitive ability are not significantly more efficient. This is in part due to the trading behavior of the sophisticated individuals. They do not only engage in rational arbitrage, but also exploit the irrationality of others by "riding the bubble". Additionally, we find that positive earnings shocks are priced more efficiently than

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negative ones.

Abstract: "In this study, we present first results on a novel framework to test rational expectation formation in a laboratory asset market. Our framework uses an asset whose value follows a random walk that experiences a shock in form of a regime shift to a random walk with either a positive or negative drift.

We find considerable heterogeneity in the dynamics of subjects' belief formation processes. Subjects with higher cognitive reflection test (CRT) scores tend to backward induct fundamental values more, while subjects with lower CRT scores merely extrapolate previous price trends. Remarkably however, the presence of more rational individuals in a market does not automatically imply higher efficiency, since markets with higher cohort-levels in CRT are not significantly more efficient. This is in in part due to the trading behavior of high-CRT subjects. Instead of only conducting rational arbitrage, subjects with high-CRT subjects tend to "ride the bubble" by posting limit orders at irrational prices. These orders are then more often traded against by low-CRT subjects. Thus, trading prices tend to reflect the beliefs of less sophisticated individuals, contrary to the rational expectations hypothesis.

The results of our paper call for further research regarding the impact of trader heterogeneity on market efficiency."

Mayrhofer, Thomas

Exploring the consistency of higher-order risk preferences

Haering, Alexander; Heinrich, Timo; Mayrhofer, Thomas

Research Question: How robust are previous findings on higher-order risk-preferences?

Main Result: Previous findings are robust with respect to stake size and country. When lotteries are displayed in a reduced rather than compound form there is no more evidence for temperance.

Abstract: "Over the course of the last decades it turned out that risk preferences are only captured partially by the concept of risk aversion. Higher-order risk preferences like prudence (Kimball, 1990) and temperance (Kimball, 1992) also impact decisions made by individuals when facing uncertainty. Higher-order risk preferences have been studied in a small number of experiments so far (for an overview see Noussair et al., 2014). These studies reveal that a majority of people is not only risk-averse, but also prudent and temperate.

In a recent laboratory experiment, Deck and Schlesinger (2014) – hereafter D&S – test the hypothesis that risky choices can be explained either by a lottery preference for combining "good" with "bad" or for combining "good" with "good" (see Crainich et al., 2013). The former implies mixed risk-averse behavior, the latter mixed risk-loving behavior. Both types differ in their preferences for lotteries of even orders but coincide for odd orders. In line with their hypothesis, D&S in fact observe a consistent pattern of behavior with US-American subjects: Risk averters tend to be temperate (order 4) and risk-apportionable of order 6 while risk lovers tend to choose in the opposite way. Furthermore, both types exhibit prudent (order 3) and edgy (order 5) behavior.

We build on the analysis by D&S and explore the consistency of higher-order risk preferences with regards to (A) cross-country differences, (B) differences in stake size, and (C) differences through displaying reduced rather than compound lotteries. We use the elicitation method introduced by D&S and conducted a series of economic laboratory experiments in China, Germany, and the US with a total of 605 subjects. In short, subjects faced a total of 38 tasks in randomized order one of which was randomly selected for payment. In each task subjects had to choose be-tween two lotteries which revealed there risk preference up to the 6th order. In order to investigate the effects of the stake size, we increased the payoff by a factor of ten for some of the Chinese subjects. In order to investigate the effect of reducing compound lotteries on choices, we ran additional sessions in Germany where the participants faced order 1 and order 2 lotteries in original (compound) form plus two additional orders in compound as well as in reduced form.

We replicate the finding of mixed risk-averse and mixed risk-loving behavior by D&S in the US and identify a similar pattern in Germany and in China. Moreover, we observe an increase in risk aversion when stakes are increased tenfold. We also observe the pattern of mixed risk-averse and mixed risk-loving behavior with high stakes. Finally, we observe that subjects choose the prudent and temperate options less often when they are displayed in a reduced rather than compound form. In the reduced lotteries there is weak evidence that subjects behave generally prudent and no evidence that they are generally temperate."

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Meissner, Thomas

I Want to Know it Now: Measuring Preferences Over the Temporal Resolution of Consumption Uncertainty

Meissner, Thomas; Pfeiffer, Philipp

Research Question: Do people have a preference for the early resolution of consumption uncertainty?

Main Result: Most participants are indifferent towards the temporal resolution of consumption uncertainty, while a minority of participants have a strong preference for early resolution.

Abstract: "We design an experiment to elicit preferences over the temporal resolution of consumption uncertainty as axiomatized in Kreps and Porteus (1978) and Epstein and Zin (1989). Subjects consume in the lab by surfing YouTube which is contrasted by a real effort task. Lotteries over consumption at different points in time introduce actual consumption uncertainty - as opposed to income uncertainty. Assessing a series of choices, we find that on average, subjects are willing to forgo about 4% of their total consumption in order to expedite the resolution of consumption uncertainty. A structural estimation suggests that subjects on average indeed prefer an early resolution consumption uncertainty. This, however, is mainly driven by a minority of subjects with a strong preference for early resolution."

Merkle, Christoph

Value and Momentum from Investors' Perspective

Merkle, Christoph; Sextroh, Christoph

Research Question: Do investors perceive momentum stocks and value stocks as more risky?

Main Result: They do not.

Abstract: "Many asset pricing studies show that book-value relative to market value and recent stock returns are both predictors of future returns. The common observation is that high book-to-market stocks and previous winners outperform compared to low book-to-market and previous losers (Fama and French 1992, 1996, Jegadeesh and Titman 1993, Carhart 1997). These results have become known as "value effect" and "momentum effect" respectively, and they have often been interpreted as risk factors. However, there is an ongoing debate whether risk can really account for the large profits attributed to a value or momentum strategy. Supportive for a risk based explanation are Liew and Vassalou (2000), Liu and Zhang (2008), and Petkova and Zhang (2005). Mixed evidence is reported by Avramov and Chordia (2006), while Lakonishok et al. (1994), Moskowitz (2003), Griffin et al. (2003), and Grundy and Martin (2001) present findings against a risk based explanation.

To resolve the anomalies represented by value and momentum, we propose an experimental approach. If these factors are really related to risk, this should be apparent in investors' risk perception, return expectations, and global impression of company stocks. Obviously, value stocks and momentum stocks should only offer a premium, if they are regarded as more risky. By asking investors for their beliefs and preferences, we obtain immediate information whether this is the case and whether a risk-based explanation is warranted. Aware that many investors (e.g., retail investors) will find it difficult to relate their expectations to concepts such as the book-to-market ratio, we use chartered financial analysts (CFA) working in the financial industry as a subject group. More sophisticated investors and analysts should be able to evaluate stocks based on accounting and past return data. As these investors represent a large market share and are important for price discovery, it is unlikely that a risk based explanation would stand, if it was absent for this group.

Furthermore, we are able to assess whether return expectations of investors are in line with the finding of a value and momentum effect. Recent research suggests that investors have difficulties in interpreting risk factors, and results will be sensitive to the question format (Kaustia et al. 2009). Often return and risk expectations are found to be negatively correlated (Shefrin 2001, Kempf et al. 2012, Weber et al. 2012), which is per se hard to reconcile with any risk-based explanation. The alternative hypothesis to investors viewing value and momentum as risk factors is that they are seen as characteristics of a stock or company, which help to form a global evaluation of the company. As Kaustia et al. (2009) report, poor growth prospects when regarded as a risk factor might lead to high required returns, while when interpreted as a characteristic it is associated with bad companies and hence low expected returns.

The study is executed as an online survey and distributed via the newsletter of the CFA institute Germany. Participants are confronted with a stylized data set on companies including book value, market value, beta, past return, past volatility, and debt ratio. The limited amount of data is to prevent participants from becoming overwhelmed by too much information. Provided values, however, contain the key variables to inform expectations about return and risk. To exclude any noise and private information participants might have, we do not disclose any names of stocks. Information items are presented in random order for two companies at a time labeled company A and B.

We then ask participants for expected return, risk and general impression of the company's stock (between and within subjects). We apply simple question formats on five-point scales, as numerical estimates especially for risk are difficult (Dave et al. 2010, Glaser et al. 2007). The question for risk ("Which of these companies' stock is riskier? ") provides the response options: 1) A is much riskier, 2) A is somewhat riskier, 3) about equally risky, 4) B is somewhat riskier, and 5) B is much riskier. The evaluation as a comparison between two stocks is chosen, as scales without any clear reference point (e.g. from "not risky" to "very risky") lack intrapersonal comparability. Similarly, we ask for expected return, again as a comparison between two stocks. We further elicit a general impression of the stock on a good vs. bad scale. It is possible that risk and return judgments are derived from such global evaluations (MacGregor et al. 2000). To keep the survey manageable, each participant evaluates 10 stock pairs, which we randomly draw from the S&P 500 US stock market index. The survey finally includes a questionnaire for demographics and job characteristics.

We find that companies, which are assessed as more risky, typically have higher volatility and higher beta. More surprisingly, they also have higher market-to-book values and higher price-earnings ratios. This means that investors perceive growth stocks as more risky, contrary to the risk-based explanation of the value premium. There is a weaker tendency for momentum; although stocks with higher past performance are considered safer (again contrary to the risk-based explanation), the effect is statistically only marginally significant. On individual level, a decision rule associating momentum and value with risk, is used by very few participants.

When asked for expected return, past performance is a much better predictor than for risk. Investors expect stocks that outperformed the market index to repeat this strong performance. They are either aware of the momentum effect or at least their expectations are consistent with it. This speaks against the hypothesis that investors are totally ignorant about momentum; they just do not associate it with risk. For expected returns there is no effect of market-to-book ratio and a negative effect of the price-earnings ratio. Investors seem to view a high PE-ratio as a particularly bad sign as it is associated with higher risk and lower return."

Neugebauer, Tibor

Experimental Stock Market Dynamics: Excess demand, adaptation, and style investing in a call-auction with multiple multi-period lived assets

Neugebauer, Tibor; Selten, Reinhard

Research Question: Is price formation an adaptive process, and can portfolio adjustment be explained by models of adaptive behavior?

Main Result: Excess bids can predict qualitative asset returns, and excess bids are formed in an adaptive way. Adaptive value-style investing and path-dependence explain a significant share of individual data.

Abstract: "We study the behavioral dynamics of limit orders in simultaneous experimental call-auction markets with multi-period lived assets. We investigate if price formation is an adaptive or predictive process, and if portfolio adjustment be explained by models of adaptive behavior. As analytical decision tool we use excess bids; the number of submitted bids minus the number of offers. Our results suggest that excess bids can predict qualitative asset returns, and that excess bids are formed in an adaptive way. We conclude that the price trend or reversal is reinforced by rejected excess bids and the fundamental laws of demand and supply instigate a regression to the mean. Our analysis of portfolio adjustment dynamics shows that adaptive value-style investing and path-dependence explain a significant share of individual data."

Özgümüs, Asri

An experimental investigation of regulatory sanctions for credit rating agencies

Keser, Claudia; Özgümüs, Asri; Peterlé, Emmanuel; Schmidt, Martin

Research Question: n.a.

Main Result: n.a.

Abstract: "We introduce a simple game-theoretical model that captures the main aspects of the repeated interaction between an issuer and a credit rating agency, in a scenario with up-front payments of issuer-fees and regulatory sanctions for false rating. The model is parametrized such that in the perfect Bayesian equilibrium the credit rating agency should always provide truthful ratings. Knowing this, the issuer should never request a rating. Conducting laboratory experiments, we find that a high proportion of issuers request ratings, which is reciprocated with a high proportion of untruthful "good" ratings, even though the credit rating agency faces (low or high) financial penalties for being untruthful. Our results are different from the game-theoretical prediction but they are in keeping with a "cooperative solution", similar to the "deterrence theory" in Selten (1978)'s chain store paradox."

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Palan, Stefan

Is there a premium for socially responsible investments?

Freundt, Jana; Lange, Andreas; Nicklisch, Andreas; Palan, Stefan

Research Question: Do socially responsible investments outperform conventional investments?

Main Result: There is no difference in valuation between conventional and socially responsible investments, but there are spillover effects from introducing socially responsible investments to a market.

Abstract: "Socially responsible investments (SRI) are a growing investment class, amounting to 1 in 6 USD in US markets today. Yet the question whether they out- or underperform conventional investments remains open. We address this gap using a new asset market design to rule out confounding factors. Our findings indicate that there is no premium for SRI investments. At the same time, the availability of SRI investments in a market influences the prices of non-SRI investments and increases traders' willingness to contribute to social responsibility topics outside of the market."

Parravano, Melanie

Financial contagion in the lab: Does network structure matter at all?

Duffy, John; Karadimitropoulou, Katerina; Parravano, Melanie

Research Question: Does a more integrated interbank market structure leads to a reduction in financial contagion? (as predicted by the Allan and Gale's (2000) model)

Main Result: Our main experimental result is that a complete interbank market structure is indeed likely to reduce the risk of financial contagion.

Abstract: "In order to examine how different market structures affect the contagion of financial fragility we designed a computerized laboratory experiment that follows closely Allen and Gale (2000) financial contagion model, henceforth AG. In our experimental setting there are four banks and participants have the role of a depositor. Following AG we focused on two different interbank market structures, namely, an incomplete market structure, where the banks are partially connected (i.e. banks hold deposits in one adjacent bank) and a complete market structure, where the four banks are fully connected (i.e. invest part of their deposits in each one of the other banks). According to the model while both market structures achieve the first-best (i.e., no bank run equilibrium), they lead to important differences when financial fragility is introduced. Our experiment was designed to test the later, for this reason, in every round we introduced a liquidity shock in one of the banks and payoffs were calibrated to capture the model assumptions. The result is a risk-sharing coordination game, where there is as a unique Nash equilibrium when the interbank network is incomplete: full contagion; whereas when the interbank network structure is complete, there is an inefficient and an efficient equilibrium: full contagion and no-contagion, respectively. We implemented two treatments between-subjects, one for each 'network structure' and participants played 30 rounds of the game. Our main research objective, was to understand whether a more integrated banking system leads to smaller self-fulfilling spillover effects, as predicted by the model. To our knowledge, this is the first experiment testing the implications of different interbank network structures for the occurrence of bank runs. Our main experimental result is that a complete interbank market structure is indeed likely to reduce the risk of contagion, i.e. in the incomplete network treatment all networks converged to the unique full-contagion equilibrium whereas in the complete only about half did. Econometric analysis also shows that in the incomplete network structure the odds of a participant withdrawing her deposit was around 2.7 times higher than in the complete network treatment, this even after controlling for past behaviour of co-players and own past behaviour as well. Moreover, in the incomplete market network, we observe the expected pattern of contagion, where there is a spillover from the shocked bank to the bank connected with it and to the next bank until the full network is affected. Therefore our results provide support to the models' prediction that in an incomplete interbank network structure an initial financial shock spreads to all banks and crisis becomes global and partial support to the models' prediction that in a fully integrated banking system a financial crisis does not become global."

Petersen, Gesa-Kristina

It's a matter of stress - How emotional Stress Consciously and Subconsciously influences Risk Behavior

Brodbeck, Felix; Maier, Markus; Petersen, Gesa-Kristina; Spickers, Theresa

Research Question: How does emotional stress (i.e. psychological pressure) influence risk behavior?

Main Result: Emotional stress makes investors behave risk averse: In domain of gains and losses and even when presented below consciousness.

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Abstract: "The disposition effect refers to investment decision behavior of selling winning assets too early and holding losing assets for too long. This pattern on risk behavior was repeatedly observed in financial markets. We examined the role of investors' stress as a moderator for risk behavior in domains of gains and losses in two experimental studies. We propose that stress involving fear overwrites typical reactions to winning and losing markets and makes investors behave risk averse. By using an applied stock investment paradigm, in Study 1 participants show behavioral patterns in accord with the disposition effect when not stressed (control group) while this is not the case when consciously experienced stress was induced (experimental group). These results suggest that consciously experienced stress moderates investment decision behavior in domains of gains and losses. In Study 2, stress was induced subliminally and again affected participants risk behavior allowing the conclusion that stress automatically influences risk behavior. The implications of these findings are twofold: First of all, the results imply that risk preferences depend on psychological states. At the same time investors are not necessarily aware of this influence. Secondly, the results can serve as an explanation on why investors behave risk-seeking during times of losses, while they behave risk-averse as a consequence of experiencing extreme losses that is after experiencing a financial crisis."

Powell, Owen

The robustness of mispricing results in experimental asset markets

Powell, Owen; Shestakova, Natalia

Research Question: Are previous results robust to an alternative measure of mispricing that satisfies numeraire independence and controls for variation in market characteristics?

Main Result: Yes, the majority of previous results are robust.

Abstract: "Price efficiency is an important property of markets that has received considerable attention in experiments since the pioneering work of Smith et al. (1988). However, concerns can be raised about the robustness of these results. In particular, 1) many of the measures of mispricing used in the literature, including the most common (Relative Deviation and Relative Absolute Deviation - Stöckl et al., 2010) fail the so-called test of numeraire independence. This means that previous treatment comparisons based may be sensitive to the arbitrary choice of numeraire asset (Powell, 2015).

Secondly, various studies have identified factors that influence mispricing (cash-to-asset ratio; market institution; type of path of fundamental values; gender composition of traders; CRT, etc.), but due to low degrees of freedom, the marginal effect of these characteristics are not identifiable. This is potentially important since even within a study, many of these factors may not be controlled for when comparing across treatments.

For example, consider the case of the cash-to-asset ratio. In the standard Smith et al. (1988) asset market design, traders are endowed with units of cash and shares. At the end of the market, units of cash are converted to earnings for the participants, and shares are worthless. Throughout the course of the market, shares pay stochastic cash dividends at regular time intervals. The expected value of the dividend payments is constant and positive, therefore the fundamental value of a share in terms of cash is positive and decreasing over the lifetime of the market. Ex-ante, markets of the same design may have the same expected cash-to-asset ratio. However, ex-post the average cash-to- asset ratio in the market may be different because of different realizations of stochastic variables. For example, in a typical parameterization (Design 4 of Smith et al., 1988), the average cash-to-asset ratio can vary by more than 100% (0.81-1.83).

This paper addresses these two issues using a dataset of over 2000 markets collected from 30 previous experimental market studies. It begins by calculating new measures of mispricing that satisfy numeraire independence (Geometric Deviation and Geometric Absolute Deviation - Powell, 2015), and using a regression to estimate the marginal effect of certain market characteristics on mispricing. In a second step, we repeat the original treatment tests from all of the studies using unexplained, rather than total, mispricing - the part of mispricing that is not explained by variations in observable market characteristics. Overall, the results show that the majority of previous findings are in fact robust to these two adjustments. In addition to confirming the role of several well-known characteristics in determining mispricing, the regression estimates also suggest additional variables that may be important."

Qu, Hong

SMARTER IN AGGREGATE: THE DIVERSITY IN FINANCIAL INFORMATION PROCESSING OF PROFESSIONALS COMPARED TO THAT OF NON-PROFESSIONALS

Barron, Orie; Enis, Charlies; Qu, Hong

Research Question: Is financial professionals' information processing more idiosyncratic than non-professionals?

Main Result: in this paper we compare the degree of idiosyncratic processing of public information between financial professionals and non-professionals in an experiment in which participants make price forecasts based on common financial information. We find that, although individual professionals are no better than non-professionals in forecasting, collectively professionals' mean forecasts are superior because the information processing among professionals is more idiosyncratic (as evidenced by a greater variance of weights put on different pieces of information and a lower correlation in forecast errors).

Abstract: "Financial professionals may not be "smarter" as a group than non-professionals. For example, even if the forecasts of individual professionals are more accurate than those of non-professionals, non-professionals may process financial information more idiosyncratically and thus make errors that tend to cancel each other out more than those of professionals. Thus, in this paper we compare the degree of idiosyncratic processing of public information between financial professionals and non-professionals in an experiment in which participants make price forecasts based on common financial information. We find that, although individual professionals are no better than non-professionals in forecasting, collectively professionals' mean forecasts are superior because the information processing among professionals is more idiosyncratic (as evidenced by a greater variance of weights put on different pieces of information and a lower correlation in forecast errors). Furthermore, the average forecast of non-professionals' contains little or nothing that is news to professionals because errors in mean forecasts of non-professionals are highly correlated with those of professionals."

Qu, Hong

The Long-Run Effect of Public Forecasts on Information Asymmetry and Price Efficiency: Evidence from a Laboratory Market

Gong, Guojin; Qu, Hong; Tarrant, Ian

Research Question: Do public forecasts that advance the timing of public disclosure have a long-run impact on price efficiency?

Main Result: In a three-period laboratory market with privately informed traders, we manipulate the availability of a forecast concerning a forthcoming public signal and the informativeness of the public signal. When the public signal is highly informative, we find that bid-ask spreads decline and price efficiency improves immediately following the forecast. Importantly, more efficient prices, as an additional source of public information, further reduce information asymmetry and improve private information aggregation even after the public signal is released.

Abstract: "Public forecasts are ubiquitous, yet it is unclear how they affect markets in the long run because they merely advance the timing of public disclosure. We conjecture and demonstrate that forecasts affect long-run information asymmetry and price efficiency by alleviating adverse selection and improving the degree to which market aggregates diverse private information. In a three-period laboratory market with privately informed traders, we manipulate the availability of a forecast concerning a forthcoming public signal and the informativeness of the public signal. When the public signal is highly informative, we find that bid-ask spreads decline and price efficiency improves immediately following the forecast. Importantly, more efficient prices, as an additional source of public information, further reduce information asymmetry and improve private information aggregation even after the public signal is released."

Rabanal, Jean Paul

Does competition affect truth-telling? An experiment with rating agencies

Rabanal, Jean Paul; Rabanal, Olga

Research Question: Does competition affect truth-telling?

Main Result: We find that competition among rating agencies significantly reduces the likelihood of misreporting.

Abstract: "We introduce an experimental approach to study the effect of market structure on the incidence of misreporting by credit rating agencies. In the game, agencies receive a signal regarding the type of asset held by the seller (who does not know the asset type). The sellers then present the asset, with the report (if one is solicited from a rating agency), to the buyer for purchase. We find that competition among rating agencies significantly reduces the likelihood of misreporting."

Rantapuska, Elias

Trust your gut: Hunger increases trust and trustworthiness

Freese, Riitta; Hytönen, Kaisa; Jääskeläinen, Iiro; Rantapuska, Elias

Research Question: Does short-term hunger affect trust and trustworthiness?

Main Result: Hunger increases trust and trustworthiness.

Abstract: "Hungry individuals trust and reciprocate more than those who have just consumed a meal. We establish this result through manipulation of hunger followed by the trust game (Study 1), and a decision on whether to leave personal belongings in an unlocked and unsupervised room (Study 2). Data on trust from the European Social Survey 2012, collected prior to and after lunchtime, also indicate that sated individuals are less trusting (Study 3). We differentiate between two alternative hypotheses: 1) hunger heightens selfish behavior and 2) hunger increases trusting and reciprocating through an increase in intuitive rather than analytical decisions. Our findings support the latter hypothesis: hungry individuals engage in less effortful cognitive processing by selecting the default choice of trusting and reciprocating. Our results also highlight how a seemingly innocent choice of scheduling a laboratory session before rather than after a meal significantly influences experimental results."

Reiss, J. Philipp

Incentive Effects of Funding Contracts: An Experiment

Reiss, J. Philipp; Wolff, Irenaeus

Research Question: How do incentives of funding contracts affect (lab-)entrepreneurial effort?

Main Result: Incentives need to be experienced, with repeated experience, the monotonic and non-monotonic contracts hypotheses of Robert Innes (JET 1990; Limited liability and incentive contracting with ex-ante action choices) works out.

Abstract: "We examine the incentive effects of funding contracts on entrepreneurial effort and on allocative efficiency. We experiment with funding contracts that differ in the structure of investor repayment and, thus, in their incentives for the provision of entrepreneurial effort. Theoretically the replacement of a standard debt contract by a repayment-equivalent non-monotonic contract reduces effort distortions and increases efficiency. Likewise, distortions can be mitigated by replacing outside equity by a repayment-equivalent standard-debt contract. We test both hypotheses in the laboratory."

Saltoğlu, Burak

Measures of Individual Risk Attitudes and Portfolio Choice: Evidence from Pension Participants

Gürdal; Mehmet; Kuzubaş, Tolga; Saltoğlu, Burak

Research Question: n.a.

Main Result: n.a.

Abstract: "We examined the relationship between the risk preferences of a relatively large group of pension participants and the share of risky investments in their retirement savings. Four distinct measures were employed to elicit risk preferences: the degree of risk taken in the Bomb Risk Elicitation Task (BRET), self-assessment of willingness to take risks in general, the choice in a hypothetical lottery, and the score in the financial sub-scale of a modified version of the Domain Specific Risk-Taking (DOSPERT) scale. Using data on demographic characteristics of the participants and their asset allocations during the years 2008-2014, we carried out a horse race of these measures to evaluate their individual and joint contributions to the prediction of equity allocation in retirement savings. We show that regressions incorporating measures of risk attitudes improve upon the fit of those relying solely on demographic characteristics. The most significant contribution is observed for the self-reported willingness to take risks. Our results are broadly consistent with the literature in that we confirm the negative effect of age, the positive effect of income, and the positive effect of being male on equity allocation."

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Schindler, David

High-Frequency Trading and Pricing Structures

Schindler, David

Research Question: What is the effect of fee structure and high frequency-traders on the behavior of human traders?

Main Result: TBD. Experiment has not run yet.

Abstract: "The anatomy of trades on a stock market floor has changed over the past decades. Human traders reading tickers and interacting with other humans have largely disappeared and replaced by automated traders in the form of computer algorithms. More recently, with the advent of powerful computer technology and improvements in data transmission technologies, so called high-frequency traders have taken an important role in asset trading. These traders usually build on their ability to execute orders more quickly (possibly in the range of nanoseconds) than everyone else and thereby eliminate potential arbitrage possibilities. Most high-frequency traders provide liquidity to markets by posting bids and asks in the form of limit orders (O'Hara 2015, JFE).

Posting limit or market orders is usually subjects to fees or rebates. The most common pricing scheme is the so called maker-taker pricing. In this pricing scheme, performing market orders is subject to a fee, while traders of limit orders receive a rebate. Bourke and Porter (2015, WP) study the impact of maker-taker pricing on an array of market outcomes in markets with human traders and find no effect other than an increase in book depth. Maker-taker pricing is an extremely lucrative pricing scheme for high-frequency traders. Because they are liquidity providers and can generate and cancel orders quicker than regular traders, a large part of their profits stems from rebates in maker-taker pricing (O'Hara 2015, JFE).

While a market purely populated by high-frequency traders can be regarded as a theorist's dream, since all the cognitive biases and limitations uncovered by the field of Behavioral Finance do not apply, surprisingly no study has yet analyzed how human traders react to the presence of high-frequency traders. The effect of beliefs about the presence of algorithmic traders is well understood (Farjam and Kirchkamp 2015, WP) -- Grossklags and Schmidt (2006, IEEE T) show how algorithmic traders primarily eliminating arbitrage affect trading behavior, but there exists no study that looks at algorithmic traders imitating a limit-order based strategy as high-frequency traders do.

This paper intends to study the changes in human behavior that arise when high-frequency traders are present, specifically with respect to maker-taker pricing that favors high-frequency traders. Because exogenous variation in both the pricing scheme and the presence of high-frequency traders is needed, an experimental setup is preferred. I suggest a novel and simplified asset market trading experiment that aims to uncover the human idiosyncrasies when dealing with high-frequency traders.

In the experiment, six subjects trade on a ten-period continuous double auction asset market. The asset has a fixed buyback value (e.g. 500 points) at the end of the experiment but pays no dividend whatsoever. After every period, the value of the asset adjusts, with equal probability by 20 points in either direction. Subjects are informed about these changes ex ante, they learn the realization of the change in value and hence any trading activities above or below the expected buyback value should be reflected in risk preferences. The choice of this setup should reduce overpricing resulting from a lack of understanding (Kirchler et al. 2012, AER).

Using a 2 by 2 variation, I introduce maker-taker fees and high-frequency traders, respectively. Maker-taker fees take the form of paying a fixed fee (e.g. 1 point) per market order and receiving a fixed rebate (e.g. 1 point) upon the execution of a limit order. This can be compared to a setup, where no such fees exist as the fee structure is revenue-neutral. High-frequency traders can only create limit orders and do not have access to the same information as subjects, i.e. they are not aware of the actual asset value. By constantly monitoring the order book, these high-frequency traders interpret changes in asking and bidding prices as future price changes and help adjust the market price accordingly by posting additional limit orders. Subjects are told the algorithm that high-frequency traders are based on. Technical restrictions force me to model high-frequency traders as reacting within tens of seconds, which is considerably slower than actual high-frequency traders. This however does not impose any limitations on the results as in the absence of other computerized traders the only requirement is that high-frequency traders are faster than human traders.

I elicit beliefs about future asset value developments in the first and second order. Additional post-experimental tasks include a test for cognitive skills, a test for risk aversion and strategic reasoning.

In my analysis, I investigate aggregate market outcomes such as prices, trading volumes and efficiency but also individual behavior. Given the beliefs about future asset value developments of orders one and two I calculate deviations from rational trading behavior and categorize traders. I look into detail at the usage of limit vs. market orders and asks vs. bids. Using finite mixture models, types of traders are classified."

Schmitz, Jan

Social Norms and Strategic Default

Brown, Martin; Schmitz, Jan; Zehnder, Christian

Research Question: What are the behavioral mechanisms underlying the increased tendency to default strategically in an economic crisis?

Main Result: Our results suggest two mechanisms that help to explain why strategic default rates increase strongly when an economy is hit by a crisis: First, borrowers feel less obliged to repay in situations in which many other borrowers do not repay either (weaker moral constraints). Second, in adverse economic conditions peers have a hard time distinguishing between strategic and fundamental defaults and are therefore less likely to punish defaulters (weaker enforcement of social norms).

Abstract: "A significant share of the mortgage defaults in the U.S. during the 2007-2009 crisis were strategic. Survey evidence suggests that the increased propensity to default strategically was partly driven by a breakdown in moral constraints and social norms to repay loans. In this paper we use experimental methods to shed new light on the behavioral mechanisms underlying the increased tendency to default strategically in an economic crisis. Our experiment isolates two important channels: First, adverse economic conditions soften moral constraints. When economic shocks cause fundamental defaults to surrounding borrowers solvent households feel less bad if they default strategically. Second, an economic contraction weakens the enforcement of social norms to repay debt: In a crisis, peers of defaulting households have a hard time distinguishing between strategic and fundamental defaults and are therefore reluctant to punish defaulting households. An economic downturn does not lead to a break-down of social norms per se, but rather creates informational uncertainty which makes it difficult to enforce the norm."

Schneider, Frédéric

Mental Capabilities and Asset Market Bubbles

Hefti, Andreas; Heinke, Steve; Schneider, Frédéric

Research Question: How do analytical and mentalizing capabilities influence asset market trading?

Main Result: Both analytical and mentalizing capability determine trading style and success.

Abstract: "We propose that observed heterogeneity in asset market trading behavior is the result of two distinct mental capabilities: analytical skill and mentalizing skill ("putting yourself in the shoes of others"). Taking this as a starting point we develop a framework to generate hypotheses about individual trading behavior and aggregate outcomes. We test these implications in a laboratory environment, where we can measure both dimensions individually and then observe trading behavior in a tightly controlled experimental asset market.

In particular, our model predicts systematic distortions of the price forecast when an individual is less capable in one dimension. As a consequence, being better in one dimension does not necessarily enhance trading success. Individuals will trade successfully only if they have both capabilities; on the other hand, subjects who can mentalize well but have poor analytical capability will suffer large losses. Traders who mentalize poorly but have high analytical skill do not trade much better than those who have neither capability. Furthermore, our model predicts that the size of the aggregate asset bubble is related to the fraction of subjects with low quantitative but high mentalizing skill, and the fraction of subjects with high quantitative but low psychological skill.

Our laboratory results corroborate these predictions. We first independently elicit subjects' capabilities in both dimensions, and then run an experimental asset market. Using the elicited skill levels, we find individual trading gains and patterns in line with our model. Furthermore, we show that bubble formation is driven by feedback loops between the different skill types. Our results also suggest both firm-level policies to select successful traders and broader implications for detecting and preventing asset bubbles. Finally, our conceptual framework could be used to explain a much broader array of non-standard economic behavior."

Spickers, Theresa

It's not fear! Emotions may not matter as much as we think in financial markets and financial crises

Brodbeck, Felix C.; Glaser, Markus; Petersen, Gesa-Kristina; Spickers, Theresa

Research Question: Do financial crises induce emotions and do these emotions influence investor behavior?

Main Result: Crises do not induce emotions but nevertheless change investor behavior.

Abstract: "It has often been suggested that fear and stress evolve during financial crises and influence investment behavior. We experimentally tested the impact of financial crises on investors' emotional reactions and subsequent behavior. First, participants invested in markets that result in either losing, volatile or neutral

price developments. Subsequently, participants took part in an experimental asset market (Smith et al., 1988). Testing 30 markets, we found a more risk-averse behavior after the loss treatment, which is in line with several studies analyzing investor reactions to financial crises. However, broad-based tests on the mediating role of emotions did not support the conjecture that behavioral differences are caused by psychological or physiological emotional reactions."

Sprenger, Julia

Naive advice in financial decision making: hidden costs of a free offer

Sprenger, Julia

Research Question: How does naive advice influence financial decision making?

Main Result: Few people would actively seek naive advice before making a financial decision. However, when given without request, naive advice nevertheless has a strong influence on the decision making process and outcome.

Abstract: "The current study examines individual decision making in the field of personal finance. How do people arrive at a financial decision? A laboratory experiment analyses the way naïve advice influences the decision making process.

For many financial decisions people get naïve advice before making their choice. There are several arguments why naive advice should be of low impact: prior research has revealed a general tendency for egocentric advice discounting (e.g. Krueger, 2003; Yaniv, 2004). This bias is particularly strong when advice is received unsolicited (e.g. Gibbons, Sniezik & Dalal, 2003; Gibbons et al., 2003). Moreover, purchased advice is more influential than advice offered for free (e.g. Gino, 2008) and advice is perceived as more helpful when offered by an expert (e.g. Jungermann & Fischer, 2005). If we consider all this, naive advice should a) attract only low demand when offered as an alternative to expert advice and b) should be ignored when given unsolicited and at no costs.

Yet changes in neuronal activation patterns indicate that one effect of expert advice on financial decision making is that individuals offload the burden of the decision process to the expert (Engelmann et al., 2009). According to these results, it is very hard to ignore expert advice, even if it comes unsolicited and free of costs.

The current study compares the effect of naïve advice on financial decision making in a scenario where naïve advice is costly and given on demand only to a scenario where naive advice is given unsolicited and free of costs. It thereby seeks to explore if low demand in the first scenario translates automatically into ignorance in the second scenario or if naive advice, too, is hard to ignore and influences the way a decision is taken.

Experimental Design

The experiment consists of two parts. In the first part, the level of financial literacy is examined, once by self-assessment and once by a financial literacy test. In the second part, participants have to solve five subsequent tasks that require the critical evaluation of financial products. In each task participants have to choose a financial product out of a range of five options (e.g. different investment products). Information about product attributes is provided in form of a table. The participant's payoff depends on the degree to which the chosen product meets predefined decision criteria. At each task participants can use a calculator to compare costs and returns across products. Furthermore, they can prepare their choice by using additional information: Participants can acquire explanations of specific terms (e.g. APR) or a recommendation for a certain product (advice). There are two types of advice available: expert advice and naive advice. Choosing expert advice, the participant knows that the advisor has answered all questions in the financial literacy test correctly. Choosing naive advice, the participant knows that the advisor has a high financial literacy according to his self-assessment but does not know the actual test result. All advisors have a monetary incentive to pass on an advice that leads to the best solution. In treatment 1, explanations as well as naïve and expert are displayed on demand only and their use is charged. In treatment 2 and 3, explanations and expert advice are displayed on demand only and their use is charged while naive advice is displayed automatically and free of costs. In treatment 3, naive advice is followed by a warning, that one has no guarantee that the advisor's self-assessment is accurate. The experiment was programmed and conducted with the software z-Tree (Fischbacher, 2007).

Results

In treatment 1, demand for naive advice is extremely low. Only two participants invest in naive advice at all while the majority of participants uses explanations as well as expert advice to prepare their decisions. However, once naïve advice is automatically displayed, information acquisition behaviour changes: In treatment 2 and 3 both demand for explanations and demand for expert advice are lower than in treatment 1. This is especially true for participants with low financial literacy and for female participants. While in treatment 1 participants preferred to acquire external information before making a choice for a financial product, in treatment 2 and treatment 3 the dominant information strategy is to rely solely on naïve advice. Overall, compliance with naive advice is quite strong in treatment 2 as well as in treatment 3. The warning in treatment 3 is of little consequences. Compliance with naïve advice is lower for participants who acquire explanations or expert advice before making their choice.

For many financial decisions people receive informal advice without request. If this kind of advice were given on demand, many people would ignore the offer. But once it comes unsolicited, it is nevertheless very hard to ignore. The crowding out effects indicate that with the presence of naïve advice a) the relative value of expert advice has sunk and b) the willingness to acquire and process explanations has decreased (offloading). In case compliance with the naïve advice leads to a low decision quality and the saving in information acquisition costs does not make up for this effect, the free offer of naive advice produces financial losses. This can be interpreted as hidden costs of free advice resulting from a switch in information strategy. People with low financial literacy are most vulnerable to this effect."

Staehr, Simone

Using feedback to reduce the cost of information intermediation: Experimental evidence

Barradale, Nigel; Plenborg, Thomas; Staehr, Simone

Research Question: What is the effect on information efficiency of having information end-users (e.g. institutional investors, individual investors) provide performance feedback to information intermediaries (e.g. financial analysts, financial advisors)?

Main Result: Allowing information end-users to provide performance feedback to information intermediaries: (i) increases effort and reduces bias among the information intermediaries; and (ii) enhances the critical evaluation of information sources among the information end-users.

Abstract: "The complexity of financial markets creates a pivotal role for information-intermediaries. As examples, equity analysts process firm-specific data and make recommendations for institutional investors, and financial advisors process market data and make recommendations for individual investors. However, as with all agency-type relationships there can be conflicts, with information-intermediaries expending low effort or presenting biased information. This paper uses experimental methods to argue that incentivized feedback-channels can ameliorate this conflict. For the information-intermediaries, the expectation of feedback increases effort and reduces bias. For the information end-users, providing feedback enhances the critical evaluation of recommendations. Both effects imply that feedback-channels have a welfare-enhancing role to play in financial market design.

Because investors generally respond more to forecasts when they expect them to be accurate (Stickel 1992; Abarbanell et al. 1995; Park and Stice 2000; Gleason and Lee 2003) biased forecasts may end up costing investors' money. The bias in analyst forecasts is the subject of academic study and regulatory oversight. Legislation that has strengthened the regulatory oversight includes Regulations Fair Disclosure (2000), Regulation Analysts Certification (2002), the Sarbanes-Oxley Act (2002), and the Dodd-Frank Wall Street Reform and Consumer Protection Act (2010). Partly in response to this regulation the broker-vote system, a method of paying for research, has developed. Investors use this system to reward good research by allocating votes towards selected analysts (Groysberg et al. 2011; Brown et al. 2014; Maber et al. 2014). Since the broker-votes determine trading commissions and thereby are part of the analyst's compensation (Maber et al. 2014), it is analogous to the incentivized feedback-channel of the current experiment.

While less studied in the finance and accounting literatures, theories in educational learning and psychology argue that providing as well as receiving feedback causes increased (meta-) cognitive reflection (Garner 1987; Falchikov 2003). Those receiving feedback tend to feel more responsible and motivated to adapt their output to the feedback-provider (e.g. Berkowitz et al. 1963; Topping 1998; Pope 2001; Brown et al. 2013). Meanwhile, those providing feedback process information more thoroughly, with enhanced reflection and increased insight into task performance (e.g. Stefani 1994; Topping 1998; Venables and Summit 2003; Li and Steckelberg 2006). This research implies that feedback-channels may enhance the alignment between the behaviors of a feedback-receiver and the goals of a feedback-provider, while simultaneously providing the feedback-provider with enhanced insight into those behaviors. In the setting of the current paper, the agency cost of information-intermediaries is reduced while the critical evaluation by the information end-users is enhanced.

We rely on an experimental setting with a relevant subject poll of 338 master students in finance. In a 2x2 between-subject design, we test how the implementation of a feedback-channel affects forecasting behaviors from the analyst's and the investor's perspective, respectively. Participants are randomly assigned the role of analyst or investor, and each analyst is randomly matched one-to-one with an investor. Both analysts and investors must provide a forecast based on available information. We introduce a bias whereby analysts randomly receive a financial incentive to either diverge from- or converge towards a consensus estimate. Further, we introduce a feedback-channel with half of the analysts being (truthfully) told that they will be rated by their matched investor and that their compensation will depend on the rating. This rating mechanism is absent for the remaining analysts. The investors are given a reduced set of information together with the matched analyst's forecast and justification (what the analyst chooses to pass on), and the analyst's incentive to either diverge or converge. The investor is paid according to the distance of their estimate from the true earnings, which is

randomly drawn from the range given to the analyst. All subjects are monetary incentivized and a post-experiment questionnaire is conducted.

We find support for the hypothesis that implementing a feedback-channel reduces analysts' responses to bias incentives and increases effort. Without feedback, analysts' responses to a diverging incentive is significantly different than to a converge incentive (t-stat. of 2.01), but in the presence of feedback there is no significant difference between the two groups (t-stat. of 0.24). Further, the feedback-channel induces more words (t-stat. of -2.62) and a better writing style (t-stat. of -2.19) in analysts' written justifications to the investors From the questionnaire we find indications that fewer analysts tried to follow a strategy complying with their given incentives and more analysts tried to help the investor when a feedback-channel exists.

We also find support for the hypothesis that implementing a feedback-channel makes the investors more critical of the analysts' forecast. In particular, the feedback-channel results in the investors' forecasts moving towards the consensus estimate and away from the analysts' recommendations (t-stat. of 3.23). This is consistent with the feedback-channel increasing the investors' attention to the biased incentives and consequently enhances their evaluation of alternate information sources. Answers from the questionnaire support these interpretations: when a feedback-channel exists, significantly less investors trust analysts to be honest and significantly more investors answer that moving away from the analyst's forecast and towards the consensus estimate is the better strategy.

Besides the general relevance of this paper to financial market design, there is specific relevance to the broker-vote system. As an incentivized feedback-channel, the broker-vote system will reduce the bias and increase the effort of equity analysts, while enhancing the institutional investors' critical evaluation of recommendations. We argue that feedback-channels should be used to reduce the bias at source and simultaneously enhance the investors' critical evaluation. This implies the use of feedback-channels as a policy tool that is both more realistic and more powerful than full disclosure of biased incentives. This is an extension to the existing academic research which primarily documents and describes the commission-allocation system (e.g., Maber et al. 2014) and moves the literature towards an evaluation of its institutional and psychological impacts. Also, to the extent that we find positive impacts of the system, we highlight some unintended consequences of the European Securities and Markets Authority's proposed prohibition of indirect payments (ESMA 2014, Section 2.15; FCA FS15/1), which would effectively prohibit the broker-vote system in Europe. "

Stefan, Matthias

On the relation between individual moral decisions and the market outcome

Huber, Jürgen; Kirchler, Michael; Stefan, Matthias; Sutter, Matthias

Research Question: What is the relation between individual moral decisions and the market outcome?

Main Result: Individual moral decisions are not reflected in prices or price dynamics, but rather in the trading frequency. Subjects decide whether to trade accepting a negative moral externality or not. Once they enter the market, however, only market forces seem to drive prices.

Abstract: "The question whether markets erode or whether they actually promote moral behavior is disputed since centuries. Only recently experimental economics/finance has gained interest in this topic (Falk & Szech 2013; Bartling et al. 2015; Kirchler et al. 2016). A related yet largely ignored question is how individual moral decisions can be observed within markets. There is a discussion on whether market prices bear negative moral externalities on third parties. However, only little research is conducted on the relation between individual moral decisions and market outcomes. We want to contribute to closing this research gap by examining the relation of moral decisions and the market outcome in an experimental study.

For this, we conduct a 3x3 treatment experiment with 480 students. In each of the eight markets of the baseline treatment, SYMM, ten subjects trade for ten periods of three minutes each. Subjects are either buyers or sellers in a market where only one trade per period is possible. Once a buyer and a seller trade, they split 21.40 Euros. The buyer receives 21.40 Euros minus the price, the seller receives the price. In treatment SELLERS6 in each market there are six sellers and four buyers, whereas in treatment BUYERS6 there are four sellers and six buyers. Since each subject can conduct only one trade in each period, two subjects forgo trading. Thus, there is an asymmetric competition situation and, in turn, higher market power for the shorter market side. Treatment SYMM_EXT is similar to treatment SYMM with a moral good introduced into the market. This moral good is a package of 100 doses of a potentially life-saving vaccine against measles, which is offered by UNICEF for 21.40 Euros. If a seller and a buyer agree on trading, then the 21.40 Euros are split. However, in this treatment trading has the negative moral externality that no donation is made and subjects, therefore, face a trade-off between gaining a monetary payout and preventing a negative moral externality. Treatments SELLERS6_EXT and BUYERS6_EXT are similar to BUYERS6 and SELLERS6, respectively, but again with the negative moral externality in case of trading. With our treatment design we want to examine how market outcomes vary given different market situations as well as different moral dimensions. This way, we can determine which market outcomes can be attributed to individual moral decisions and which to market conditions.

Sometimes it is suggested that prices do reflect the moral values and decisions of subjects. However, we do not

find significant differences in prices between the treatments with and without externalities. Furthermore, we find that price dynamics are not different between treatments with and without externalities. Rather, prices and price dynamics can be explained by market competition situations: Due to the competition situation the shorter side has market power and can drive prices up or down, respectively, depending on whether high or low prices are more profitable to them. In contrast, we find significant differences in the trading frequency (normalized by the number of maximum possible trades) between treatments with and without externalities. Trading frequency is high and close to 100% in the treatments without externalities and significantly reduced in treatments with externalities. We, therefore, argue that moral considerations and values of subjects are reflected in the decision whether to participate in trading or not. Once this personal decision is taken, only market forces seem to drive prices. We find further support for this conjecture in the data on individual traders: First, 10.8% of subjects are refusing to trade in any of the 10 periods and 7.5% of subjects even refuse to submit an order in the treatments with externality. Second, we observe that personal attitudes towards donation as well as political attitudes can explain the decision to enter a market with a moral externality or not.

Given these results, we conclude that the individual moral decision subjects face is whether to enter a market with a negative moral externality or not. This is reflected in the trading frequency and depends on personal characteristics and attitudes. Once this decision is made, market prices and price dynamics can be explained by market conditions, rather than subjects' moral choices."

Stöckl, Thomas

Speculation and Price Indeterminacy in Financial Markets

Hirota, Shinichi; Huber, Jürgen; Stöckl, Thomas; Sunder, Shyam

Research Question: In laboratory experiments we explore whether investors' difficulty in forming rational expectations is a cause of price indeterminacy in financial market.

Main Result: We find that in markets with speculating investors price deviations are larger; price deviations increase as the holding period of investors shrinks (and frequency of security transfers increases); speculative trading creates upward (downward) pressure on prices when liquidity is high (low).

Abstract: "We explore how speculative trading causes price indeterminacy in financial markets. Contrary to standard finance theory, we argue that speculating investors' difficulty in forming rational expectations induces security prices to deviate from the fundamental values. We conducted a laboratory asset market experiment with overlapping generations of investors. We find that in markets with speculating investors (i) price deviations are larger; (ii) price deviations increase as the holding period of investors shrinks (and frequency of security transfers increases); (iii) speculative trading creates upward (downward) pressure on prices when liquidity is high (low); and (iv) price expectations are formed through forward induction from recent price changes, instead of backward induction from the fundamentals. The results suggest that speculation causes price indeterminacy when dynamic formation of inter-temporal rational expectations is infeasible."

Szymczak, Wiebke

Information display and complexity on experimental asset markets

Angerer, Martin; Szymczak, Wiebke

Research Question: How does visualization of information affects pricing behavior and market efficiency on asset markets?

Main Result: Different modes of visualizing the same information do influence market efficiency and subject´s response times.

Abstract: "Even tough, the relevance of visual representation is widely recognized in other disciplines, such as Psychology and Marketing, financial research often neglects the potential influence of different modes of displaying information on individual and group behavior. Our study contributes to this field by investigating the effect of different modes of display on trading behavior and market characteristics in experimental asset markets. Treatments differ only with respect to the way in which private signals about the underlying asset value are presented. Drawing from real-world examples, we compare individual behavior and market dynamics in computerized double auction markets, displaying either (i) a numerical estimate of the fundamental value (FV), or (ii) as a relative measure, the numerical deviation of the signal from the current market price, or (iii) the numerical estimate complemented with a sign underlining deviations from the current best trading opportunity, or (iv) the numerical estimate embedded in text. Analyzing established key figures, such as measures of mispricing and asymmetry, trading volumes and bid-ask spreads, our results suggest that information display and complexity have a notable effect on price levels and market efficiency."

Szymczak, Wiebke

Testing the endowment effect hypothesis in experimental asset markets

Angerer, Martin; Szymczak, Wiebke

Research Question: Can we observe an endowment effect among traders in experimental asset markets?

Main Result: Yes.

Abstract: "Since the late 1970s, many researchers have investigated the existence and causes of differences between the price people are willing to pay for a good (WTP) and the price they are willing to accept (WTA) when buying and selling an identical good. While some scholars claim that effects differ for consumption goods and exchange goods, little research has covered the existence of such differences and the relevance of the associated endowment effect hypothesis for financial markets. In light of the recent debate on experimental procedures in WTA-WTP experiments, we contribute evidence on pricing asymmetries in market trades of a risky asset. In this experimental study, we investigate the effect of value perception on pricing behavior in computerized double auction markets. Our design strictly complies with the criteria for WTA-WTP experiments, proposed by Plott and Zeiler (2005). We find statistically significant evidence in support of the endowment effect hypothesis despite extensive training, incentive-compatible incentives and market-based elicitation."

Weber, Matthias

An Experimental Study of Bond Market Pricing

Duffy, John; Schramm, Arthur; Weber, Matthias

Research Question: n.a.

Main Result: n.a.

Abstract: "The experimental literature on asset markets has provided many useful insights on the efficiency of the market mechanism. It is unclear whether these results carry over to bonds markets, however. An important feature of bond markets is the relationship between initial public offering (IPO) prices and the probability that the bond issuer will default. First, this probability affects the value of the bond and therefore the bond prices. Second, prices paid for the bonds in the IPO determine the bond issuer's financing costs and therewith affect the probability of a default. We develop a flexible bond market model that accounts for this two-way interaction and that is easily implemented in the laboratory and we examine how subjects price bonds in this setting. Although it is much more difficult for subjects to price these bonds than assets in previous asset market experiments, we find that subjects learn to price the bonds well after only a few repetitions (both during the IPO and while trading in the secondary market afterward). Bubbles are observed only with inexperienced traders. This market efficiency is observed both, in environments with increasing and decreasing (equilibrium) fundamental values."

Weitzel, Utz

Disposition Effect and Market Efficiency

Li, Jingyan; Qiu, Jianying; Janssen, Dirk-Jan; Weitzel, Utz

Research Question: n.a.

Main Result: n.a.

Abstract: "The disposition effect, the tendency of selling winning stocks too early and holding losing stocks for too long, is an anomaly for standard financial theories. In this paper, we experimentally examine the effect of the disposition effect on market efficiency. In the experiment we first measure the level of the disposition effect in a novel experimental method. The experimental method measures the disposition in both gain domain and in loss domain. Then, subjects trade in a computer-based double auction market. The main treatment variable is the private signals that traders receive (positive shocks versus negative shocks), and the type of traders who receive these signals (traders with the high disposition effect versus traders with the low disposition effect). The 2×2×2 design (two measures of the disposition effect × two types of shocks × two types of traders who receive the private signals) allows us to investigate how the disposition effect influences the informational efficiency of financial markets. Our experimental results indicate that the two measures of the disposition effect, measures based on the gain domain and measures based on the loss domain, are two distinct processes, and thus they should be treated separately in the future research. Additionally, we observed significant market under-reaction. The under-reaction is stronger when the private signals are given traders with the low disposition effect and this tendency is more obvious when the information shocks are positive. "

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Zeisberger, Stefan

What is risk? Understanding how investors perceive financial risk in return distributions

Anzoni, Laura; Zeisberger, Stefan

Research Question: What is financial risk when investing in risky assets? How does it drive investment decisions?

Main Result: Variance as a risk measure fails to fully explain how people perceive risk in an investment context. Loss probability is an important factor.

Abstract:

"Motivation

What is financial risk when investing in risky assets? How does it drive investment decisions? While traditional finance does not leave room for any discussion, as variance is the one and only risk measure, and it is just a question of how risk averse investors are with regard to variance, there now seems to be some consensus in the behavioral finance and psychology literature that perceived risk differs from objective risk and from variance (e.g. "risk-as-feeling hypothesis", Loewenstein et al., 2001). Yet, it is still not at all clear whether there exists an objective measure that could be used as proxy for that part of risk that is determined by financial constructs. While many experimental studies exist on the topic, they are based on simple lotteries (see Wallmeier, 2010), and thus the conclusions may well not to be directly transferable to a real financial context (see e.g. Weber et al., 2002; Weber and Zuchel, 2005; Nosic and Weber, 2010; Weber et al., 2013). In fact, there is growing evidence that the complexity of a decision task affects risk perception and risk choice (Payne 2005, Diecidue et al. 2015). The existing experimental literature that approaches our important research question in a way that allows for real-world applications is surprisingly scarce (for an exception see Veld and Veld-Merkoulova 2002). Moreover, the list of mathematical measures taken into account as possible proxies for risk is usually not exhaustive. In order to advise investors correctly, it is crucial to identify the potential future outcomes of an alternative that make it risky in their eyes, and what discourages them from investing.

Goal

With a series of experiments, we aim to identify the mathematical risk measures that describe a return distribution and that can be used as a proxy for perceived risk. Moreover, we link perceived risk to the investment propensity, holding return expectations constant. This allows us to determine to what extent different risk measures affect the propensity to invest. Generally, our results should support financial advisors and regulators to effectively communicate the risks associated with an investment option, and thus to avoid suboptimal decisions.

Method

We conducted three main experiments (plus some control experiments). To avoid that our results are affected by any learning effects, we used different participants for each of the three studies. The underlying method is to keep the expected return constant for all different return distributions, but to have pronounced differences in various risk measures. To fully understand what risk measures affect investors' risk perception, we use a variety of different measures and explicitly address the ten following: standard deviation, semi-variance, loss probability, skewness, kurtosis, maximum return, minimum return, probability of earning less than the risk-free rate, and probability of earning less than the market return.

Experiments 1 and 2 aim to understand what the idea of risk is that private investors have in mind and what drives investment propensity when they think about the possible future developments of an investment alternative. Experiment 3 is designed to investigate what the past developments of a potential investment option are that make retail investors perceive it as risky.

In Experiment 1, participants are presented with ten different distributions. Each distribution represents the hypothetical future performance of a specific stock, in form of return histograms, where each bar is proportional to the frequency with which a certain return occurs. The bars representing negative returns were depicted in red, the ones for positive returns in green. We also ran two control experiments one with non-students (Experiment 1a) and one with students (Experiment 1b), in which participants were presented with uniformly colored bars instead.

In Experiment 2 we use a slightly different representation of the return distributions. Ten different returns are ordered ascendingly, and each one is equally likely to be realized in one year, if a person decided to invest in that stock today.

In Experiment 3 participants were presented with historical returns that are only indicative for future returns. To that end, decisions were "more" made under uncertainty than under risk as in Experiment 1 and 2.

Following the psychometric approach, participants are asked to assess how risky they perceive each stock to be, as well as how likely they would invest in it, both on a Likert scale from 1 (minimum value) to 7 (maximum value). Various other control questions help us to rule out other explanations and allow us a rich analysis. In the following we will focus on the main results only.

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Specific Results

Generally speaking, we find that variance (or standard deviation) as a risk measure fails to fully explain how investors perceive risk. In contrast, the results from Experiment 1 highlight the crucial role that the probability of losing plays in determining the perceived risk by an investor. This measure alone can explain up to 98% of the variations in the average perceived risk, and is the only factor that delivers a non-zero explanatory power for the individual perceived risk. Similar results are obtained from the two control experiments (i.e. Experiments 1a and 1b), although there is at least slight evidence for some students considering earning less than the risk-free rate as risky as earning simply less than 0%.

When the potential future performance consists only of a few returns and is presented as in Experiment 2, participants' risk perception is driven by the combination of the loss probability and the worst case return.

The results from Experiment 3 show that when investors are asked to assess the risk they perceive a stock has, judging by its past performance, the standard deviation and either the frequency of negative returns or the skewness seem to be the driver of riskiness perceived when aggregate data are analyzed.

From all experiments it emerges that perceived risk is the main driver of investment propensity, affecting it negatively (see graph below). At the same time a higher self-assessed willingness to take financial risk leads to a slightly higher willingness to invest.

Overall Results and Conclusion

We strongly believe that our findings are important for investors, financial advisors and regulators. They can relatively easily be applied in a real investment context: The loss profile of an investment option, and specifically the loss probability, seems to be the crucial factor that represents, at least partially, the idea of risk that investors have in mind when they think of how a stock's payoff could evolve in the future. Variance as a risk measure fails to fully explain how people perceive risk in an investment context. Hence, financial advisors and regulators could focus on this factor to help private investors understand what the most suitable investment option for them is. Having shown that loss probability is a deterrent to investing, which could lead to suboptimal decisions, advisors should make more efforts in concretely explaining to their clients the consequences of a loss, maybe with simulation tools, which have been shown already to be effective in the case of mis-estimation of loss probability (see Kaufmann et al. 2013, Bradbury et al., 2014)."

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