

Some general information

PROGRAM: Talks have been planned according to the recommendations of the referees, the speakers' availability, the speakers' self-selection to a category (e.g. market, individual decision making), and, finally, according to topics. We have two keynotes, four plenary sessions, and 14 parallel sessions.

TALKS: The slot for a talk is about 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. We did, however, change the protocol. Each speaker in a session 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 talk (no slides necessary as in the years before) and then to lead the discussion, i.e. you serve as kind of a starter of the discussion.
- **@chairs:** As usual the last speaker in a session is the chair.
- **@audience:** We have more participants registered than expected. Thus, it is almost impossible to attend one of the parallel sessions with all guests at the same time.

BUS: A bus will bring those who stay in the Fletcher Parkhotel Val Monte (former Golden Tulip) to the venue; departure at the hotel is at 8:50am. In the evening we have a shuttle from Landmark Wijnfort to the hotel until midnight. For people who stay somewhere else, I suggest to go to www.9292.nl to look at the connections. The next bus station to Fort Lent is "Bushalte Turennesingel". However, the distance to the city is about 3 km and a cab will probably save a lot of time.

Food: We tried to take your wishes into account and the venue is instructed accordingly. On the first day a barbecue is planned and on the second day we would have different food islands. On both days you can stay after the dinner if you would like to. Drinks are included. For lunch we have excellent sandwiches and some extras.

Sponsors

Royal Netherlands Academy of Arts and Sciences



The Royal Netherlands Academy of Arts and Sciences was founded in 1808 as an advisory body to the Dutch Government – a role that it continues to play today. The Academy derives its authority from the quality of its members, who represent the full spectrum of scientific and scholarly endeavour and are selected on the basis of their achievements. It is also responsible for sixteen internationally renowned institutes whose research and collections put them in the vanguard of Dutch science and scholarship.

De Nederlandsche Bank



DNB seeks to safeguard financial stability and thus contributes to sustainable prosperity in the Netherlands. To this end, DNB operates as an independent central bank and supervisor to ensure price stability and balanced macroeconomic development in Europe, together with the other central banks of the Eurosystem, a shock-resilient financial system and a secure, reliable and efficient payment system, and strong and sound financial institutions that meet their obligations. By issuing independent economic advice, DNB strengthens policies aimed at its primary targets.

Multidisciplinary research group 'Integrated Decision making' (ID)



The multidisciplinary research group 'Integrated Decision making' (ID) focuses on management decisions that cut across the individual, group and inter-group level. Real world decision making increasingly demands theories and methods that link analysis of individual preferences, intra-organizational behavior, and societal challenges with intervention strategies that support decision makers. Think of issues such as making urban areas sustainable, reduction of energy consumption, reducing operational risk in the finance sector and adaptive delta management. What these issues have in common is that decision makers find themselves in a network of actors with different problem perceptions, multiple (often conflicting) goals and diverging preferences for solutions, across the individual, organizational and societal level. Scientific theories and methods are required that acknowledge these differences between actors and between levels of decision making and translate these into intervention strategies.

Nijmegen School of Management

At the Nijmegen School of Management, the staff was able to combine academic research and education to create a challenging curriculum in the fields of public administration, business administration, business economics, geography, environment, spatial planning and political science. A rich and inspiring blend of subjects with great social significance can be found here.



Contact Information

Conference email address: ef2015@ru.nl

Local Organization

Sascha Füllbrunn
Assistant Professor of Finance
Radboud University Nijmegen, Department of Economics
Visiting address: Room 5.1.15, Thomas van Aquinostraat 5, 6525 GD Nijmegen, The Netherlands
Postal address: P.O. Box 9108, 6500 HK Nijmegen, The Netherlands
+31-(0)24-3615474, s.fullbrunn@fm.ru.nl, sascha.fuellbrunn.de

Utz Weitzel
Professor of Finance, Head of the Department of Economics
Radboud University Nijmegen, Department of Economics
Visiting address: Room 5.1.26, Thomas van Aquinostraat 5, 6525 GD Nijmegen, The Netherlands
Postal address: P.O. Box 9108, 6500 HK Nijmegen, The Netherlands
+31-(0)24-3616235, u.weitzel@fm.ru.nl, www.utzweitzel.com

SEF Conference Officer

Michael Kirchler
Professor of Finance
University of Innsbruck, Department of Banking and Finance
Postal address: Universitätsstraße 15, 6020 Innsbruck, Austria
+43 (0)512 507 7587, michael.kirchler@uibk.ac.at,
<http://www.uibk.ac.at/ibf/mitarbeiter/kirchler.html>

Time schedule

Wednesday		
8:50	Transfer	
9:20	Reception	Welcome
9:30		WPlen1
10:50	Break (25min)	Biais
11:15	Lunch (60min)	WPar3
12:30		WPar4
13:30	Break (25min)	WPar5
14:50	Break (25min)	General Assembly
15:15	Break (25min)	
16:15	Break (25min)	
16:40	Break (10min)	
18:00	Welcome Reception	Transfer
18:40		

Thursday		
8:50	Transfer	
9:15		TPlen6
10:35	Break (25min)	TPar7
11:00	Lunch (60min)	software
12:20		TPar8
13:20	Break (25min)	TPlen9
14:20	Break (25min)	TPar10
14:45	Break (25min)	
16:05	Break (25min)	
16:30	Break (10min)	Conference Dinner
17:50	Transfer	
18:00		

Friday		
8:50	Transfer	
9:15		FPlen11
10:35	Break (25min)	FPar12
11:00	Lunch (40min)	Smith
12:20	Good bye coffee	Transfer
13:00		
14:15		
14:45		

Notes:

"Transfer" = 8:50 Bus from Parkhotel Val Monte to Fort Lent; Evening: Shuttle from Fort Lent to Parkhotel Val Monte until midnight

Session ID's indicate the day (W,T,F), plenary or parallel session (Plen, Par), and the room (parallel session in blue room (B) or red room (R))

WPlen1 09:20	Welcome Sascha Füllbrunn, Utz Weitzel, Michael Kirchler
	Predictably irrational: Gambling for resurrection in experimental asset markets? Baptiste Massenet (Tibor)
	Catch me if you can. Can human observers identify insiders in asset markets? Stefan Palan (Baptiste)
	Rational and Heuristic-Driven Panics in an Experimental Asset Market Chad Kendall (Stefan)
	A test of the Modigliani-Miller invariance theorem and arbitrage in experimental asset markets Tibor Neugebauer (Chad)

11:15	Risk sharing and asset pricing in complete markets: An experimental investigation Bruno Biais
-------	--

WParB3 13:30	Peer Effects and Risk Sharing in Experimental Asset Markets Paul Gortner (Paul Debapriya)
	Endogenous participation in experimental asset markets in the presence of volatility shifts Adriana Breaban (Paul Gortner)
	Liquidation Policy and Disclosure of Credit History in Financial Contracting: An Experiment Yohanes E. Riyanto (Adriana)
	The Aggregate Impacts of Tournament Incentives in Experimental Asset Markets Paul J. Debapriya (Yohanes)

WParR3 13:30	The effect of learning on ambiguity attitudes: An experiment using initial public offerings on a stock market Chen Li (Tomas)
	Optimal timing of exercising a financial option contract under an experimental framework Konstantina Mari (Chen)
	Investors' Reinforcement Learning Jiao Peiran (Konstantina)
	Learning and loss aversion: Evidence from a financial betting experiment Tomas O'Brian (Jiao)

WParB4 15:15	Adaptive Investment Strategies during Financial Crises: An Experiment with Financial Professionals Michal Paserman (Matteo)
	When owners buy higher, they offer higher rents: Experimental evidence Shinichi Hirota (Michal)
	Would Slowing Finance Improve Financial Markets Efficiency? Some Experimental Evidence Matteo Ploner (Shinichi)

WParR4 15:15	Eliciting interval beliefs: An experimental study Leonard Wolk (Ismail)
	How not to measure overconfidence Ferdinand Langnickel (Leonard)
	Observation of Decision Process of Individuals and Their Risk Attitudes: An Eye-Tracking Experiment Ismail I. Dzhemile (Ferdinand)

WParB5 16:40	Heterogeneity of beliefs and trade in experimental asset markets Tim Carle (Joep)
	Information Aggregation in Arrow-Debreu Security Markets: An Experiment Lawrence Choo (Tim)
	Trading linear and non-linear Assets in a continuous double Auction Market: An experimental Study of Financial Complexity Felix Fattinger (Lawrence)
	Learning and Evolution in a Multi-Round Strategy-Method Minority-Game Experiment Joep Sonnemans (Felix)

WParR5 16:40	Hot Hand and Gambler's Fallacy in Teams: Evidence from Investment Experiments Florian Lindner (Te)
	The Hot Hand Fallacy and Mutual Fund Fees Oege Dijk (Florian)
	Heterogeneous Adaptive Expectations in a Learning-to-Forecast Experiment Annarita Colasante (Oege)
	When Speculators Meet Constructors: Experimental Study on Supply Elasticity and Price Stability in the Housing Market Te Bao (Annarita)

TPlen6 09:15	Fostering the Best Execution Regime - an Experiment about Pecuniary Sanctions and Accountability in Fiduciary Money Management Alec N. Sproten (Stefan)	
	No Time for Losers! Rankings and Risk-Taking in the Finance Industry. Michael Kirchler (Alec)	
	The Mechanics of Reputational Cheap Talk: An Experiment with Crystal Balls Debrah Meloso (Michael)	
	Risk, Time pressure, & Selection effects Stefan Trautmann (Debrah)	
TParB7 11:00	Absent-minded Investors and their effect on financial and macroeconomic cycles Dimitra Papadovasilaki (Nobuyuki)	TParR7 11:00
	How private investors' stress influences investor behavior and financial markets Gesa-Kristina Petersen (Dimitra)	The Impact of Distracted Attention and Perceived Reputation on Investor Confidence and Portfolio Choice under Uncertainty André Schmelzer (Ryoko)
	Unleashing Animal Spirits - Self-Control and Overpricing in Experimental Asset Markets Konstantin E. Lucks (Gesa-Kristina)	The Perception of Dependence and Investment Decisions Martin Weber (André)
	Effect of heterogeneity in a cognitive ability among traders in an experimental asset market Nobuyuki Hanaki (Konstantin)	Portfolio Choice Based on Aspiration Ryoko Wada (Martin)
		Tba
12:45	Software Presentation: hroot	
TParB8 13:20	Bubbles, Experience, and Success Natalia Shestakova (Mark)	TParR8 13:20
	Overpricing and Stake Size: On the Robustness of Experimental Asset Markets David Schindler (Natalia)	Limited Liability: A clash of social and egoistic preferences in financial decision making for others Wolfgang J. Luhan (Thomas)
	Trading Outcomes and Price Dynamics in Some Experimental Asset Markets Mark V. Van Boening (David)	Testing dashboards for default superannuation funds experimentally Andreas Ortmann (Wolfgang)
		Intertemporal Consumption and Debt Aversion: An Experimental Study Thomas Meissner (Andreas)
TPlen9 14:45	Estimating Ambiguity Preferences and Perceptions in Multiple Prior Models: Evidence from the Field Roy Kouwenberg (Jürgen)	
	Testosterone and Trading: A Biological Driver of Asset Mispricing Amos Nadler (Roy)	
	All's Well That Ends Well? On the Importance of How Returns are Achieved Stefan B. Zeisberger (Amos)	
	The influence of investment experience on market prices. Laboratory evidence. Jürgen Huber (Stefan)	
TParB10 16:30	System Stability and (Bad) Experience: An Experimental Study of Banking Crises René Hegglin (Jana)	WParB10 16:30
	Do women self-select as good borrowers? Irene Comeig (René)	Individual Preferences and the Exponential Growth Bias Moritz Lukas (Daniel)
	Take it or leave it? Financial Literacy, Confidence, and Information Strategy Julia Sprenger (Irene)	The impact of different tournament incentives on asset markets: Theory and experiment Dawei Fang (Moritz)
	Trust and risk revisited Jana Vyrastekova (Julia)	The Effects of Make & Take Fees in Experimental Markets Vincent Bourke (Dawei)
		On the provision of incentives in finance experiments. Daniel Kleinlercher (Vincent)

Friday, June 19th

FP1en11 09:15	An Experimental Asset Market with a Random Walk Charles N Noussair (Brice)	
	Bubbles in hybrid markets - How expectations about algorithmic trading affect human trading Mike Farjam (Charles)	
	Cognitive Bubbles Cyril Bosch-Rosa (Mike)	
	On the Cognitive Foundations of Information Aggregation in Asset Markets: Reflective Learning & Market Efficiency Brice D Corgnet (Ciril)	
FPParB12 11:00	Asset Markets with Insider Trading Regulations: An Experimental Analysis Halim Edward (Owen)	FPParR12 11:00
	Does short selling eliminate the price impact of behavioral biases in experimental markets? Alexander Klos (Halim)	
	Familiarity Bias and Equity Home Market Bias Puzzle: Evidence from Laboratory and Field Experiments King King Li (Alexander)	
	Measuring mispricing in experimental asset markets Owen Powell (King King)	
FPParR12 11:00	Ambiguity attitudes and borrowing behavior Kim Fairley (Christian)	FPParR12 11:00
	Chronic Stress and Risky Decisions Christiane Schwierén (Kim)	
	Personal Information in Peer-to-Peer Loan Applications: Is Less More? Fabian Prystav (Christiane)	
	Good decision vs. good results: Outcome bias in financial agents' rewards Christian König-Kersting (Fabian)	
13:00	Recessions and Market Experiments: The Good and the Sometimes Ugly Vernon Smith	

Abstracts

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

Bao, Te

When Speculators Meet Constructors: Experimental Study on Supply Elasticity and Price Stability in the Housing Market

Bao, Te; Hommes, Cars

Research Question: How housing supply elasticity influences housing price dynamics?

Main Result: Housing bubbles are less likely when the supply elasticity is larger.

Abstract: Short Abstract: Housing market distinguishes itself from other asset markets in the way that the supply of housing is endogenous, and responds to the changes in the housing price. We investigate experimentally whether larger supply elasticity tends to stabilize or destabilize the market price. The results suggest that when the supply elasticity goes up, the market price is generally more stable. There is no systematic difference between the individual price predictions by the constructors and investors. The price dynamics can be described by a heterogeneous expectations model based on evolutionary selection of prediction rules very well. (Full paper will be submitted.)

Bosch-Rosa, Ciril

Cognitive Bubbles

Bosch-Rosa, Ciril; Meissner, Thomas; Bosch-Domenech, Antoni.

Research Question: Does confusion drive bubbles in SSW88ECMA?

Main Result: Yes it does, markets populated only by high cognitive ability subjects do not bubble

Abstract: Smith et al. (1988) reported large bubbles and crashes in experimental asset markets, a result that has been replicated by a large literature. Here we test whether the occurrence of bubbles depends on the experimental subjects' cognitive sophistication. In a two-part experiment, we first run a battery of tests to assess the subjects' cognitive sophistication and classify them into low or high levels of cognitive sophistication. We then invite them separately to two asset market experiments populated only by subjects with either low or high cognitive sophistication. We observe classic bubble- crash patterns in the sessions populated by subjects with low levels of cognitive sophistication. Yet, no bubbles or crashes are observed with our sophisticated subjects. This result lends strong support to the view that the usual bubbles and crashes in experimental asset markets are caused by subjects' confusion and, therefore, raises some doubts about the external validity of this type of experiments.

Bourke, Vincent

The Effects of Make & Take Fees in Experimental Markets

Vincent Bourke and David Porter

Research Question: n.a.

Main Result: n.a.

Abstract: We conduct a series of experiments to examine the effects of the make and take fee structure currently used by equity exchanges in the U.S. We examine the effects of these fees on measures of market quality (allocative efficiency, trading volume, book depth, and the bid-ask spread). With the exception of increased book depth, we document no significant effects of make and take fees relative to a baseline case in which trading fees are assessed on both sides of a transaction.

Breaban, Adriana

Endogenous participation in experimental asset markets in the presence of volatility shifts

Arago, Vicent; Barreda, Ivan; Breaban, Adriana; Matallin, Juan Carlos; Salvador, Enrique

Research Question: Does the market risk aversion decrease in a high volatility context?

Main Result: During high-volatility periods: (a) the average market risk aversion decreases compared to the low-volatility periods, and (b) at the individual level, there is a higher probability to exit the risky market, although this effect is reduced when the agent is less risk-averse.

Abstract: Investors' behavior in financial markets is a topic that has generated a considerable amount of research both from a theoretical and an empirical point of view. In the field of financial economics, most models need from assumptions about the investors' attitudes toward risk. The majority of the theoretical models (on which most of the modern asset pricing methodologies are based) are obtained using the optimum of an equilibrium model where the investors try to maximize their multi-period expected utility function. This optimum is obtained after several assumptions about the behavior of the representative investor.

One of the theoretical models that has been very successful in the financial economics literature is the Capital Asset Pricing Model (CAPM). However, this model is based upon strong assumptions regarding investors' behavior. In this model the investors a) aim to maximize the expected utility (asset quantities are given or fixed) b) are rational and risk-averse c) are broadly diversified across a range of investments d) are price-takers and e) have homogeneous expectations among other assumptions (see Sharpe(1964) and Litner (1965) for further details). According to this model, it is assumed that the investors' behavior is not sensitive to the uncertainty/risk state in the market. The risk aversion level of the representative investor and the relationship between expected return and risk of a financial asset are considered constant and independent of the state of the market (high or low volatility). However, there is a new branch of the literature (Bliss and Panigirtzoglou , 2004, Rossi and Timmermann, 2010, and others) which questions these assumptions and concludes that investors' behavior is not independent of the market volatility.

This paper is aimed at providing an explanation for the recent theoretical insight and empirical evidence indicating that the market risk aversion decreases in a high volatility context. Does the state of the market (high/low volatility) affect the investors' perception of risk and therefore their decision to trade or leave the market? And is this the mechanism through which relative risk aversion decreases in a volatile market? To answer this question we propose an experimental design in which participants can decide whether they prefer to trade in a risky asset market or perform a task as an Accountant. While the market operates, we exogenously vary its volatility and every time we do so, participants have the chance to decide whether they want to stay in the market or act as accountants. Our design, therefore, allows us to identify behavioral differences under varying volatility conditions in a within-subjects analysis. We are also able to measure, at the market level, the relative risk aversion of the market and test our main hypothesis, that the risk aversion in a setting such as ours is state dependent. The experiment consists of two parts. In the first part subjects' individual risk aversion level is measured using the Sabater-Grande and Georgantzis (2002) protocol. This task was constructed to compensate riskier options with higher risk-return trade-offs and it is capable of capturing two dimensions of individual risky decision making: subjects' average willingness to take risk and their sensitivity towards variations in the return to risk. A higher score in the test, by the way it was constructed, reveals a less risk-averse attitude of an individual. The second and main part of the experiment consisted of a 20-period asset market and, alternatively to the market, subjects could opt to participate in a real effort task solving arithmetic sums. The markets were formed every five periods when subjects were asked to choose whether they preferred to act as traders or as accountants. Therefore, at the beginning of periods 1, 6, 11 and 16, each participant would choose a role for the immediate 5 periods, and would get the chance to reverse that decision after those periods had elapsed. In these 5 periods block, the volatility was exogenously varied by changing the possible dividend payments. Such that in the low volatility periods there was a 50-50 chance that the asset would earn 17 ECU or 0 ECU for each asset hold in the inventory. In the high volatility periods dividend payments could be either 25 ECU or -2 ECU with the same probability. In each session, high and low volatility conditions were alternated four times, changing the order in different sessions. We conduct a market- and individual- level analysis. The main findings of our study suggest that during high-volatility periods: (a) the average market risk aversion decreases compared to the low-volatility periods, and (b) at the individual level, there is a higher probability to exit the risky market, although this effect is reduced when the agent is less risk-averse. The joint interpretation of these results allow us to conclude that the more risk-averse investors leave the risky market during high-volatility periods and only the less risk-averse investors continue trading. Therefore, the average risk-aversion level in the market will decrease and, as a consequence, the price of risk. This result is in line with the intuition of Bliss and Panigirtzoglou (2004) and provides experimental support for the results obtained by Rossi and Timmermann (2010), Arago and Salvador (2011, 2012), Salvador et al. (2014), among others, about the existence of a pro-cyclical risk-aversion/price of risk in financial markets.

Carle, Tim

Heterogeneity of beliefs and trade in experimental asset markets

Carle, Tim; Lahav, Yaron; Neugebauer, Tibor; Noussair, Charles

Research Question: Are traders' beliefs coincide with actions, and are accurate beliefs imply higher profits?

Main Result: Traders' beliefs are consistent with their actions, profits are higher when beliefs are more accurate, and belief dispersion leads to higher prices but not to higher trade volume.

Abstract: We investigate individual beliefs about future asset prices elicited by monetary incentives from traders in an experimental asset market where homogeneity in beliefs would imply no trade in equilibrium. The data show that subjects trade more frequently if they hold extreme beliefs about the future market values of assets. Those who have high price expectations buy more frequently and those who hold low price expectations sell more frequently than average. More generally, the minimum selling price when submitting offers and the maximum purchase price when submitting bidding orders depend positively on subjects' beliefs. Thus, the experimental evidence suggests that heterogeneity of beliefs makes people trade. Price levels are impacted by the dispersion of beliefs since more optimistic traders are in the market owed to the experimental short-sale constraint. The dispersion of beliefs is high when subjects are inexperienced and also arises with high observed price changes. With repetition of experimental markets, the level of heterogeneity in beliefs drops but the laboratory market is not able to homogenize individual expectations completely and does not achieve a no-trade equilibrium.

Choo, Lawrence

Information Aggregation in Arrow-Debreu Security Markets: An Experiment

C.Y. Lawrence Choo, Todd R. Kaplan and Ro'i Zultan

Research Question: Are Arrow-Debreu Markets able to aggregate diverse and private information when the process of doing so is sufficiently complex?

Main Result: With some experience, information aggregation is reflected by market prices but not by the ex-post market beliefs of experimental subjects

Abstract: n.a.

Colasante, Annarita

Heterogeneous Adaptive Expectations in a Learning-to-Forecast Experiment

Annarita Colasante, Mauro Gallegati, Antonio Palestrini, Alberto Russo

Research Question: does the rational expectation hypothesis hold in the financial market?

Main Result: Agents make their forecasts following different kind of adaptive rules. The heterogeneity and the volatility of the predictions increase if agents must predict a variable price instead of a constant value.

Abstract: The present work analyzes the individual behavior in an experimental asset market in which the only task of each player is to predict the future price of an asset. To form their expectations, players see the past realization of the asset price in the market and the current information about the mean dividend and the interest rate. We investigate the mechanism of expectation formation in two different contexts: in the first one the fundamental value is constant, while in the second the fundamental price increases over repetitions. Results show that there is heterogeneity both within and between groups. Agents follow adaptive rules to predict future prices and this implies that, in the majority of the cases, they coordinate on a price different from the fundamental value.

Comeig, Irene

Do women self-select as good borrowers?

Irene Comeig, Ainhoa Jaramillo-Gutiérrez and Federico Ramírez

Research Question: Do women self-select as good borrowers?

Main Result: Incentive compatible contracts with collateral fail to disclose women private information, while they disclose men private information.

Abstract: Getting credit is key to start or succeed in business. Under asymmetric information, banks typically offer incentive compatible contracts (with collateral) to induce borrowers to disclose their private information. However, if women are particularly averse to financial risk, they may be classified as high risk borrowers thus not receiving the loan designed for the good borrowers, or even suffering credit rationing. We conduct, in three different European countries, a laboratory experiment to study systematic gender differences in self selection. Our results show that incentive compatible contracts with collateral fail to disclose women private information, while they disclose men private information. Thus, low risk women borrowers do not self select as “theoretical” good borrowers. Our results show that gender differences arise when subjects face downside risk, i.e. low failure probabilities. We provide some suggestive evidence on gender differences in probability weighting in downside risk environments.

Corgnet, Brice D

On the Cognitive Foundations of Information Aggregation in Asset Markets: Reflective Learning & Market Efficiency

Brice Corgnet; Mark DeSantis; David Porter

Research Question: How much do experimental asset markets aggregate information?

Main Result: Evidence for information aggregation is scarce. Specific cognitive skills, such as cognitive reflection, are necessary for traders to infer information from market prices and lead to information aggregation.

Abstract: The ability of markets to aggregate disperse information is key to assess the often-debated efficiency of markets. We study information aggregation in the simple experimental environment which was originally designed by Plott and Sunder (1988). We start by showing that, in contrast with the current belief, markets do not successfully aggregate disperse information. Instead, the equilibrium concept that best describes the data of our current research as well as previous research on information aggregation since Plott and Sunder (1988) is prior information (Lintner, 1969). That is, most traders use their prior information for trading but fail to use prices to infer other traders’ information from market prices. We argue that reflecting on asset prices to infer others’ information takes specific cognitive skills. We identify such reflecting skills as being related to cognitive reflection and not to general intelligence per say.

Debapriya, Paul J.

The Aggregate Impacts of Tournament Incentives in Experimental Asset Markets

Paul, Debapriya Jojo; Henker, Julia; Owen, Sian

Research Question: How do prices in experimental asset markets behave under tournament incentives when participants can trade more than one type of risky asset, and how does adding a penalty for underperformance to a tournament contract affect prices in this environment?

Main Result: Unlike the single-asset literature, we find no compelling evidence that suggests prices in two-asset markets are more distorted under tournament incentives than normal incentives. Penalties embedded into tournament contracts are associated with less trading activity compared to reward-only tournament contracts, but they are also associated with longer periods of overvaluation and higher prices, albeit only with inexperienced traders.

Abstract: Existing studies of the aggregate impacts of tournament incentives find that asset price bubbles in (experimental) markets are larger and do not dissipate with experience when participants trade under tournament incentives. However, these results potentially overstate the real-world impacts of tournament incentives for two reasons. First, they examine tournaments in a restrictive single-asset market setting, which constrains the risk-taking options available to traders. Second, by purely conferring additional rewards for good relative performance, the tournament contracts used ignore the risk-moderating role played by penalties that are also written into or implicit in real-world counterparts. We address these gaps by examining how prices behave under

tournament incentives in experimental markets where participants can trade two assets with differing risk-levels. In addition, we compare price behaviour under tournament incentives with and without an embedded penalty for poor performance. Our findings suggest that the results in the existing literature are driven by the single-asset nature of their markets – we do not find any compelling evidence that prices in two-asset markets are more distorted under tournament incentives than normal incentives. Moreover bubbles in these markets do diminish with experience under tournament incentives. Also, while penalties embedded into tournament contracts are associated with less trading activity in markets compared to reward-only tournament contracts, they are also associated with longer periods of overvaluation and higher prices, albeit only with inexperienced traders. These results are particularly significant in light of the recent debate attributing financial market instability to convex incentive structures such as tournament incentives.

Dijk, Oege

The Hot Hand Fallacy and Mutual Fund Fees

Dijk, Oege; Pagel, Michaela; Malliaris, Steve

Research Question: Does the hot hand fallacy explain positive and dispersed fund manager fees?

Main Result: Past performance predicts management fee, but this is highly reduced with competition.

Abstract: One of the main unresolved issues in the mutual fund literature is the fact that mutual funds charge fees that seem disproportionate relative to the services they provide. Excessive fees or fees above the competitive level can be explained by phenomena such as 1) naive investors may become suspicious about very-low fees and hence firms cannot set a price below marginal cost, as in Heidhues, Koszegi, and Murooka (2014), 2) charging very low fees and attracting investors from other rivals may induce consumer education and hence each manager cannot do so completely, as in Murooka (2014), or 3) each product can be perceived differently even under perfect competition, as in Gabaix, Laibson, Li, Li, Resnick, de Vries (2013).

Price dispersion for homogenous products is documented in the economic literature for different categories of consumer goods and is considered to be an indirect measure of market inefficiency. Such price dispersion is also documented in homogeneous investment services such as money market funds (Christoffersen and Musto, 2002) and index funds (Hortaçsu and Syverson, 2004). Christoffersen and Musto (2002) focus on money market funds and attribute fee dispersion to the heterogeneity of investors in terms of performance sensitivity. Funds that cater to less sensitive investors can charge higher fees for the same service than those that cater to more performance-sensitive investors. Hortaçsu and Syverson (2004) attribute the existence of price dispersion among S&P 500 index funds to the non-portfolio-related salient characteristics of the funds, switching costs and search costs. Although US equity mutual funds do not offer a homogeneous investment service, Carhart (1997) shows that their price dispersion is not explained by the ex-post performance of the portfolio. Gil-Bazo and Ruiz-Verdú (2009) show a negative relationship between gross performance and expenses after controlling for a number of funds' salient characteristics. Apart from the puzzle of the negative correlation with past performance, Hortaçsu and Syverson (2004) generally observe significant price dispersion and Iannotta and Navone (2011) show that it stems primarily from the heterogeneity of products, clienteles and production functions.

Huber, Kirchler, and Stöckl (2008) conduct an experiment in which subjects can bet on coin tosses themselves or can pay experts to do the coin tosses for them. The authors observe that subjects delegate to experts after observing a streak of good performance, as predicted by the hot-hand fallacy. If subjects do not delegate, they tend to bet for heads (tails) after observing a streak of tails (heads), as predicted by the gambler's fallacy. The experts' payments are set exogenously by the experimenters. Choi, Laibson, and Madrian (2012) show experimentally that the vast majority of subjects fail to minimize fees placing a high weight on realized returns since inception of the fund even when non-portfolio services and search costs are absent. Powdthavee and Riyanto (2012) asked participants in their experiment to bet on a series of five coin flips; prior to betting, they were offered a chance to pay for a prediction of the outcome of each toss. The researchers noted that the predictions were random, and the coin toss fair, participants were happy to pay for the predictions particularly if the predictions in the earlier rounds had been correct. Fisch and Wilkinson-Ryan (2013) find in an online survey experiment that subjects allocated more money, on average, to higher-value funds and that subjects who received the fees instruction paid closer attention to mutual fund fees. However, the effects of even a blunt fees instruction were limited, and subjects were unable to identify and avoid clearly inferior fund options following naive diversification strategies instead. Dominitz, Hung, and Yoong (2008) show in a large and diversified survey experiment that most investors fail to minimize expected fees.

Recent experimental evidence shows that subjects pay for portfolio managers even if their recommendations are useless adding to an empirical literature that people overpay for portfolio managers, such as Hackethal et al (2012) and Bergstresser et al (2009).

Theoretically we explore a model in which investors observe good performance and then infer high skill and expect better performance. This inference makes investors indifferent between investing with a perceived-high-skill manager paying a positive fee, investing with a perceived-medium-skill manager paying a somewhat lower

but positive fee, or investing themselves. However, in a competitive environment, any manager should have an incentive to reduce his fee and attract more investors. Thus, fees should be zero in equilibrium despite investors' mistaken beliefs about performance. Genaioli, Shleifer, and Vishny (2015) put forward the idea that people stick to their investment advisor to manage their portfolios because they trust him. This trust gives the manager monopoly power and allows him to charge a positive fee for his services even if the financial advice industry is competitive. But, the trust aspect is absent in our model which implies that fees should be zero in a competitive environment. We run an experiment in which managers set their fees themselves and investors then decide whether they are willing to pay those fees. We then vary both whether investors are able to observe past performance, and the amount of competition between fund managers.

Dzhemile, Ismail I.

Observation of Decision Process of Individuals and Their Risk Attitudes: An Eye-Tracking Experiment

Pitz, Thomas; Sickmann, Jörn; Ismail, Dzhemile

Research Question: Are there any significant differences between decision behaviour and risk attitude classifications of individuals?

Main Result: The results of this study showed a significant positive correlation between participants' final lottery decisions and evaluation durations on the decision specific informational areas. Between the groups of risk averse and risk loving participants, a significant difference on the evaluation of payoff or probability related informational areas were found.

Abstract: This paper considers the situation in which an individual has to make a decision between two lotteries. We combined the lottery choice experiment with an eye-tracker to evaluate decision behaviour of participants and to test the predictions of Expected Utility Theory. We also searched for the existence of any correlation between the evaluation behaviour and risk attitude classification of participants.

Edward, Halim

Asset Markets with Insider Trading Regulations: An Experimental Analysis

Halim, Edward; Riyanto, Yohanes Eko

Research Question: Does disclosure and holding requirement improve market quality?

Main Result: Greater transparency moderates asset bubble and improves market liquidity. Adding restrictive rule however produces mitigating effect on the ameliorative role of transparency protocol.

Abstract: We investigate the desirability properties of a compulsory post-trade insider trade disclosure protocol in the securities market, and whether the interaction with a restrictive holding rule produces ameliorative effect on asset price formation in an experimental setting. Information of transactions involving traders with better information on the dividend state is revealed to the public in the continuous double auction market. Our results show that greater transparency moderates asset bubble. Of particular interest is the lack of insiders' attempts to move market price beyond the fundamentals, as evidenced by the higher rate of accurately priced executions. Looking into changes in market liquidity and insiders' market power, we attribute the constraints to self-interest pursuit to a growing presence of competition for assets from uninformed traders. We extend our study by requiring insiders to hold recently purchased securities for two trading periods before reselling them. Our findings demonstrate the mitigating effect of restrictive rule on the improvement in the market quality. The prolonged and aggravated mispricing originates from the departure of traders' willingness to engage in price stabilizing transactions. Increasing insider attempt to extract rent for forgone capital gain flexibilities is observed along with a contraction in market trading volume, suggesting a weakened competitive force as a contributor to the rise of speculative strategies. The experiment outcomes have important implications not only for the novel design of informed traders and transparency protocol in SSW market model, but more importantly for how we might think about the role of holding rule in a more transparent environment.

Fairley, Kim

Ambiguity attitudes and borrowing behavior

Fairley, Kim; Weitzel, Utz

Research Question: n.a.

Main Result: n.a.

Abstract:

Since Ellsberg (1961) showed that people have a preference for risky over ambiguous prospects that are equivalent under subjective expected utility, a vast amount of literature has studied the richness of ambiguity preferences. Depending on the particular outcome domain, the underlying source and likelihood of uncertainty, people can also display ambiguity seeking behavior. The term *a*-insensitivity (ambiguity-generated likelihood insensitivity) relates to the phenomenon that the same individual usually overweights low levels of likelihood and underweights high levels of likelihood. With ambiguity attitudes we refer to ambiguity aversion and *a*-insensitivity in this study. Despite these insights, few studies have tried to find evidence for ambiguity attitudes and their effects outside the laboratory. Empirical studies that have focused on external validity find that ambiguity attitude measured in the laboratory is pervasive in real life choices. For instance it has been found that *A*-insensitivity has a negative relation with stock market participation and private business ownership (Dimmock et al., 2012), ambiguity aversion influences smoking behavior in adolescents (Sutter et al., 2013) and that Peruvian farmers who avoid ambiguity in an experimental task are less likely to adopt new varieties of crop (Engle-Warnick et al., 2007).

In this study we measure students' ambiguity attitudes in the laboratory and study its relationship with real life student' borrowing behavior. We test whether students borrow more when they are less ambiguity averse and how *a*-insensitivity relates to students' borrowing behavior. On average, about 35% of Dutch students currently borrow (Nibud, 2012). A majority of students in the Netherlands opt for a part-time job instead of taking out a student loan. Financial literacy, debt aversion and standard economic factors as risk, time discounting and available (family) income are potential explanations to non-borrowing by students (Oosterbeek and van den Broek, 2009; Borden et al., 2008; Eckel et al., 2007). The data on non-borrowing behavior primarily stem from survey questionnaires, and rarely from experimental measures. In this study we take another approach and express students' aversion to borrowing as an aversion to the uncertainty of being able to repay debt after obtaining a degree.

233 subjects participated in an incentivized laboratory experiment. We collected decisions in four separate tasks and administered a questionnaire that asked about their real life borrowing behavior regarding student loans. Ambiguity attitudes were elicited based on matching probabilities of three ambiguous likelihood events: 0.1, 0.5 and 0.9. Based on these three individual matching probabilities we extract indices of ambiguity aversion and *a*-insensitivity (Abdellaoui et al., 2011). Our fourth task was a risk elicitation based on certainty equivalents.

We find both ambiguity aversion and *a*-insensitivity in our sample. About 1/3 of all students borrow on a monthly basis. Our main finding is that ambiguity aversion influences the degree to which one borrows: the more ambiguity averse, the less a student borrows.

This study highlights the empirical relevance of experimentally elicited ambiguity attitudes in explaining real life decisions. In an era of budgetary cuts the Dutch government wishes more students to make use of student loans. Our paper poses several policy suggestions based on the relationship between ambiguity aversion and borrowing behavior.

Fang, Dawei

The impact of different tournament incentives on asset markets: Theory and experiment

Fang, Dawei; Holmen, Martin; Kirchler, Michael; Kleinlercher, Daniel

Research Question: Do different tournament incentives of fund managers, such as being the top vs avoiding the bottom, have different impact on asset markets?

Main Result: Inflated asset price is more likely to occur when fund managers aim to be top performers than when they aim to avoid being bottom performers.

Abstract: It is well documented that mutual fund managers have tournament incentives in the finance industry. These tournament incentives imply several features. On the one hand, it can be considered as a winner-takes-all tournament in the sense that mutual funds aim to be top performers, since only top performers can capture a significant increase in capital inflows (see, e.g., Chevalier and Ellison (1997), Sirri and Tufano (1998), and Huang, Wei, and Yan (2007)). On the other hand, the incentives are analogous to as an elimination tournament in the sense that fund managers want to avoid being the bottom performers, since bottom performers face a high

chance of having their positions terminated (see, e.g., Chevalier and Ellison (1999), Qiu (2003), and Kempf, Ruenzi, and Thiele (2009)). Moreover, Brown, Harlow and Starks (1996) find that managers whose mid-year performance is below the median fund's performance take more risks in the second-half of the year than managers whose mid-year performance is above the median. This suggests the existence of a beat-the-market tournament in the sense that a fund manager tries to beat the medium performance of the peer funds.

In this paper we investigate differences in price efficiency and individual trader behavior between winner-takes-all, elimination, and beat-the-market tournaments. We set up a simple asset market model in which some traders are fund managers who have tournament incentives and care only about the ranking of their performance relative to their peers while the others are ordinary traders who only care about their final wealth. There is only one risky asset in the market, with a random buy-back value. We focus on the tournament effects and abstract from the asymmetric information issue, which has been examined experimentally (see, e.g., Stöckl (2014)), by assuming that the buy-back value has a continuous symmetric distribution known to all the traders. We distinguish between three tournament structures: i) winner-takes-all tournaments in which less than one half of fund managers win, ii) beat-the-market tournaments in which exactly one half of fund managers win, and iii) elimination tournaments in which more than one half of fund managers win.

Our theoretical findings have the following implications.

i. In winner-takes-all tournaments, there exist both herding and anti-herding, in the sense that one group of fund managers herd into the risky asset while the other group of fund managers herd out of the risky asset. They bet on one end of the market by either fully cashing into or cashing out of the risky asset. Thus, trading volume is high. Asset price is weakly increasing in managers' initial cash endowments. Overpricing occurs when fund managers have a sufficiently large amount of initial cash.

ii. In beat-the-market tournaments, fund managers behave as if they are expected-wealth maximizers and the asset price equals the fundamental value. Given that the asset price equals the fundamental value, a big range of trading volume is supported by equilibrium.

iii. In elimination tournaments, there exist multiple equilibria, but in all the equilibria, fund managers herd by adopting the same trading strategy and have the same end-of-period portfolio. Given this herding behavior, a wide range of market prices and trading volumes are supported by equilibrium. If market price deviates from the fundamental value, trading volume is high, but not higher than that in winner-takes-all tournaments. If market price equals the fundamental value, a big range of trading volume is supported by equilibrium.

Given the theoretical results, we then run experiments in the laboratory. Since, according to the existing empirical evidence, all these three tournaments may simultaneously play a role in practice, when investigating their effects on the asset market in the field, it is hard to disentangle the effects of one type of tournament from the effects of other types of tournaments. In contrast, laboratory experiments enable us to circumvent this problem by isolating each type of tournaments and investigate their effects on asset market separately.

Our experiments consist of 4 treatments. In every treatment, there are 8 subjects who trade in a limit-order market with one risky asset; each subject is endowed with 4000 Taler (the virtual currency) and 20 risky assets at the start of each trading period, and the risky asset has a buy-back value which is uniformly distributed between 0 and 100. The 4 treatments differ in the roles of the subjects. In the no-tournament treatment, all the 8 subjects are ordinary traders and each ordinary trader's payout is purely determined by his own end-of-period wealth. In the rest of the 3 treatments, among the 8 subjects, 4 are ordinary traders while the other 4 are fund managers. Each fund manager's payout is determined by the ranking of his end-of-period wealth relative to peer managers. Particularly, these 3 tournament treatments are (i) winner-takes-all tournaments (WTA), in which among the 4 managers, only the top performing manager wins a prize, (ii) beat-the-market tournaments (BTM), in which the managers ranked #1 and #2 each win a prize, and (iii) elimination tournaments (EL), in which the managers ranked #1, #2, and #3 each win a prize.

Based on our theory and the above parametric assumptions for the experiments, we draw the following theoretical predictions for a fundamental value of 50:

In the benchmark of no tournament, theory predicts that (i) asset price=50, (ii) any trading volume in a big range is possible. In WTA, theory predicts that (i) asset price=56.2, (ii) trading volume is high, and (iii) some managers herd while other managers anti-herd. In BTM, theory predicts that (i) asset price=50, (ii) any trading volume in a big range is possible, and (iii) managers behave as fundamental value chasers. In EL, theory predicts that (i) any asset price between 25 and 75 is possible, (ii) trading volume is higher but not higher than that in WTA if asset price deviates from fundamental value, while if asset price equals fundamental value, any trading volume in a big range is possible, and (iii) managers herd.

In the experiments we find overpricing in the WTA- and BTM-treatments. Here, prices are above 60 and exceed the theoretical benchmarks clearly. In Treatment EL, however, we observe that prices are very close to the fundamental value of 50 and within the theoretically predicted boundaries. Hence, tournament structures that focus on beating the market can lead to inflated prices on asset markets.

Farjam, Mike

Bubbles in hybrid markets - How expectations about algorithmic trading affect human trading

Farjam, Mike; Kirchkamp, Oliver

Research Question: How do expectations about algorithmic traders change human trading?

Main Result: Human traders trade assets closer to the fundamental value when they expect algorithmic traders on the market.

Abstract: Bubbles are omnipresent in lab experiments with asset markets. But these experiments were (mostly) conducted in environments with only human traders. Today markets are substantially determined by algorithmic traders. Here we use a laboratory experiment to measure human trading behaviour changes if these humans expect algorithmic traders. To disentangle the direct effect algorithmic traders have we use a clean design where we can manipulate only the expectations of human traders. We find clearly smaller bubbles if human traders expect algorithmic traders to be present.

Fattinger, Felix

Trading linear and non-linear Assets in a continuous double Auction Market: An experimental Study of Financial Complexity

Chesney, Marc; Fattinger Felix

Research Question: How does complexity affect trading behavior and the quality of investment decisions in markets with aggregate risk and what are potential supply- and demand-side drivers of complex financial products?

Main Result: We postulate and experimentally test the following four hypotheses. (i) In the presence of aggregate risk, increasing levels of complexity result in similar effects on trading (of the underlying linear asset(s)) as documented by Carlin et al. (2013) (i.e., lower liquidity and higher price volatility). (ii) Self-monitoring traders are more likely to strategically utilize complexity in order to enlarge their expected gains from trade. (iii) Traders suffering from overconfidence in judgment (in the form of miscalibration, i.e., the unawareness of their lacking capability to process complex information) are more likely to systematically incur losses from adverse selection (i.e., from trading against counterparties better capable to understand complex assets). (iv) Increasing complexity generally leads to worse investment decisions as measured by the risk and return profile of traders' final positions.

Abstract: The contribution of this paper is threefold. First, we study how the introduction of complexity – in the form of non-linear asset(s) – into financial markets influences bidding behavior and price formation of the underlying linear asset(s) in a limit order book. Second, we separately analyze both supply and demand for complex assets, while controlling for traders' ability to determine their true payoff distribution. Third, we investigate if increasing complexity alters the quality of investors' trading decisions as measured by the overall position's risk and return profile.

While recent research has primarily focused on the supply-side motives for increasing financial complexity, only little is known about the implications of complexity on trading and price aggregation.¹ One recent exception constitutes the experimental study by Carlin et al. (2013). They are the first to systematically isolate complexity's effects on trading behavior using a controlled environment. Unsurprisingly, Carlin et al. (2013) find higher complexity to increase volatility, lower liquidity, and decrease trade efficiency (i.e., less gains from trade). More strikingly, they provide strong evidence that one important channel through which high complexity alters traders' bidding strategies is not just due to additional noise arising from estimation errors, but rather stems from a classical adverse selection problem. Intuitively, given traders' private values of the tradeable asset are affiliated, the fear of the winner's curse (i.e., to systematically lose by trading against counterparties better able to process complex price information) leads traders to submit more conservative ask and bid quotes.

We expand the work by Carlin et al. (2013) in two dimensions. On the one hand, our experimental analysis combines complexity with real world financial market's inherent uncertainty. It is by no means obvious, how and to which degree adverse selection induced by complexity affects trading patterns, asset pricing, and risk sharing in financial markets with aggregate risk. On the other hand, we argue that our experimental design allows us to identify – in a still relatively simple setup – both potential supply- and demand-side drivers of the steadily increasing complexity widely observed in today's retail markets for financial products (as in, e.g., vast parts of Europe – see Célérier and Vallée (2014) and the references therein). More specifically, we postulate and experimentally test the following four hypotheses. (i) In the presence of aggregate risk, increasing levels of complexity result in similar effects on trading (of the underlying linear asset(s)) as documented by Carlin et al. (2013) (i.e., lower liquidity and higher price volatility). (ii) Self-monitoring traders are more likely to strategically utilize complexity in order to enlarge their expected gains from trade. (iii) Traders suffering from overconfidence in

judgment (in the form of miscalibration, i.e., the unawareness of their lacking capability to process complex information) are more likely to systematically incur losses from adverse selection (i.e., from trading against counterparties better capable to understand complex assets). (iv) Increasing complexity generally leads to worse investment decisions as measured by the risk and return profile of traders' final positions.

Our experimental design consists of four main trading rounds. Trading between subjects occurs anonymously via computer terminals, utilizing limit order book(s) programmed in z-Tree (Fischbacher (2007)). During the first two rounds, participants can trade one fundamental asset whose terminal payoff is normally distributed, where we ensure trading incentives by imposing different endowments (either cash or shares of the risky asset). In the beginning of the second round, subjects are either provided with the opportunity to buy or sell (depending on their group affiliation) one complex asset whose terminal payoff is non-linear and contingent on the final value of the underlying fundamental asset. At the end of each round, payoffs are realized and participants total wealth is distributed. During the third and fourth round, there coexist two fundamental assets whose terminal payoffs are independent and normally distributed. In the beginning of the fourth round – and in accordance with the second round – subjects can again either buy or sell complex assets. However, in addition to the non-linear asset introduced in round two, they are also given the opportunity to trade a second complex asset that exhibits a so-called worst-off payoff profile, i.e., whose terminal payoff ex-ante depends on the final value of both fundamental assets. Providing subjects with the possibility to choose between the two non-linear assets, allows us to investigate both the incentives for and the effects of varying degrees of complexity. To date, we have conducted one pilot run and two rounds of the experiment are scheduled for the end of March as well as the beginning of April, respectively (as integral part of a graduate class in quantitative finance at the University of Zurich).

Gortner, Paul

Peer Effects and Risk Sharing in Experimental Asset Markets

Baghestanian, Sascha; Gortner, Paul; van der Weele, Joel

Research Question: How do peer effects influence market outcomes?

Main Result: Peer effects reduce risk taking in experimental asset markets.

Abstract: The ability of markets to aggregate disperse information is key to assess the often-debated efficiency of markets. We study information aggregation in the simple experimental environment which was originally designed by Plott and Sunder (1988). We start by showing that, in contrast with the current belief, markets do not successfully aggregate disperse information. Instead, the equilibrium concept that best describes the data of our current research as well as previous research on information aggregation since Plott and Sunder (1988) is prior information (Lintner, 1969). That is, most traders use their prior information for trading but fail to use prices to infer other traders' information from market prices. We argue that reflecting on asset prices to infer others' information takes specific cognitive skills. We identify such reflecting skills as being related to cognitive reflection and not to general intelligence per say.

Hanaki, Nobuyuki

Effect of heterogeneity in a cognitive ability among traders in an experimental asset market

Akiyama, Eizo; Funaki, Yukihiro; Hanaki, Nobuyuki; Ishikawa, Ryuichiro

Research Question: How do the average cognitive ability among market participants, as well as their perceived heterogeneity, influence the price dynamics in an experimental market?

Main Result: We found that heterogeneous markets (3H3L) generated a significantly larger mis-pricing than two homogeneous markets (6H or 6L). Thus, it is not only the average cognitive ability of traders in the market, but also their perceived heterogeneity, that matters for mis-pricing observed in these asset markets.

Abstract: How do a cognitive ability among market participants, as well as their perceived heterogeneity of the ability among them, influence the price dynamics in an experimental market? We investigate this question by first measuring a cognitive ability of our subjects, and construct a market by grouping subjects based on their relative measured ability. Subjects whose measured ability is above the median in the session is called H. Otherwise, they are called L. Three types of markets with six traders are created: 6H (all six traders are H), 6L (all six traders are L), and 3H3L (equal number of H and L traders). We found that heterogeneous markets (3H3L) generated a significantly larger mis-pricing than two homogeneous markets (6H or 6L). Thus, it is not only the average cognitive ability of traders in the market, but also their perceived heterogeneity, that matters for mis-pricing observed in these asset markets.

Hegglin, René

System Stability and (Bad) Experience: An Experimental Study of Banking Crises

Hegglin, René

Research Question: Do factors like experience, induced risk aversion, level-k thinking, and disclosure quality influence the system stability and reduce the likelihood of banking crises?

Main Result: We find that previous (bad) experience as well as risk aversion reduce system stability while level-k thinking has no significant influence.

Abstract: By creating liquid claims on illiquid assets banks provide liquidity to investors but are also exposed to panic-based bank runs. In this paper we implement an experiment based on a global games approach. We investigate the effects of previous experience, induced risk aversion, level-k thinking, and of disclosure quality on the sensitivity of investors to bad signals. Our preliminary results suggest that risk aversion as well as previous bad experiences reduces system stability while level-k thinking has no significant influence.

Hirota, Shinichi

When owners buy higher, they offer higher rents: Experimental evidence

Shinichi Hirota; Kumi Suzuki-Löffelholz; Daisuke Udagawa

Research Question: Do rents determine real estate prices, or vice versa?

Main Result: Both. We observed a positive interaction between real estate prices and rents.

Abstract: This study explores whether real estate prices affect future rents. The mass media sometimes argue that a rise in prices leads to a rise in rents. This view cannot be accepted from the viewpoint of standard economic theory, because the theory considers the real estate price paid by an owner as a sunk cost that should not affect his/her rent offering behavior. However, based on recent studies in behavioral economics and real estate economics, we could hypothesize that real estate prices (sunk costs for owners) can affect the rents that owners offer. While this price-to-rent relationship is not easily tested by empirical studies because of a reverse causality problem, this study adopts an experimental approach that is free from this problem. We design a laboratory experiment in which a real estate market opens before a rental market and examine whether owners' purchase prices influence their rent offering behavior. We find that prices do affect rents: namely, the higher the prices paid by owners, the higher the rents they offer. In addition, we confirm that higher contracted rents lead to higher prices in subsequent real estate markets. These experimental results suggest a positive interaction between real estate prices and rents in the real economy, which may explain the acceleration of real estate price bubbles.

Huber, Juergen

The influence of investment experience on market prices. Laboratory evidence.

Juergen Huber, Michael Kirchler, Thomas Stoeckl

Research Question: How does prior investment experience influence price efficiency in markets?

Main Result: We find that (i) both, positive and negative, experience gained in the investment game lead to efficient pricing in both market settings. Further, we show that (ii) the experience effect dominates potential effects triggered by positive and negative sentiment generated by the investment game.

Abstract: We run laboratory experiments to analyze the impact of prior investment experience on price efficiency in asset markets. Before subjects enter the asset market they gain either no, positive, or negative investment experience in an investment game. To get a comprehensive picture about the role of experience we implement two asset market designs. One is prone to inefficient pricing, exhibiting bubble and crash patterns, while the other exhibits efficient pricing. We find that (i) both, positive and negative, experience gained in the investment game lead to efficient pricing in both market settings. Further, we show that (ii) the experience effect dominates potential effects triggered by positive and negative sentiment generated by the investment game. We conjecture that experiencing changing price paths in the investment game can create a higher sensibility on changing fundamentals and prices among subjects in the subsequently run asset market.

Kendall, Chad

Rational and Heuristic-Driven Panics in an Experimental Asset Market

Kendall, Chad

Research Question: When do subjects panic, forgoing information, to avoid being front-run by others?

Main Result: Theoretically-predicted 'rational' panics occur, but almost half of subjects instead follow a heuristic that leads to both too few and too many panics.

Abstract: We study financial market panics in an experimental setting. In particular, we study a tradeoff that we believe is relevant in actual financial markets: the tradeoff between spending time to obtain better information and the potential price movements that may occur during this time. At any point in time, financial market participants must decide whether to gather more information about an asset, allowing for a better trading decision, or to rush to trade on one's current information in order to avoid the possibility that prices move adversely. If all market participants are gathering information, allowing others to trade before you is costly in expectation, because they are more likely to uncover similar information and trade in the direction you intend to trade. In previous work, Kendall (2014), we showed that when faced with this tradeoff, it can be rational to panic: to trade as soon as possible to avoid adverse price movements. Here, we extend the theoretical model of our previous paper to allow for simultaneous trading, and explicitly test the equilibrium predictions in the laboratory.

When traders panic and forgo information, markets have reduced informational efficiency because less information gets aggregated into prices. In our laboratory results, we find that rational panics occur and result in the predicted informational losses. In particular, in a treatment in which rational panics should occur, all traders rush to trade immediately and simultaneously, forgoing the chance to obtain perfect information about the asset value. This treatment provides a robust demonstration of the extreme clustering of behavior and resulting informational losses that motivated our original theory. On the other hand, in a treatment in which the equilibrium prediction is to spend time gathering better information, non-equilibrium panics instead occur, producing informational losses over and above those predicted by the theory.

Because we have precise theoretical predictions about when and in what direction subjects should trade, we can easily identify deviations. Characterizing these deviations, we show that non-equilibrium panics are due to almost half of subjects following a particular heuristic that leads to not only panics, but also herd behavior. As subjects observe prices moving in a particular direction, they rush to trade in the same direction, regardless of their private signal. This herd behavior produces short-term correlations in returns, a well-known feature of actual financial markets.

Exploring the behavioral foundations of the heuristic, we show that it is consistent with subjects having reference-dependent preferences, and cannot be explained by other popular behavioral theories. Furthermore, we suggest reference-dependence as an explanation for the previously unexplained herd behavior observed in related experiments. The resulting picture is one in which reference-dependence leads to forgoing information acquisition and herding, simultaneously explaining previous experimental data and well-known market phenomena.

Kirchler, Michael

No Time for Losers! Rankings and Risk-Taking in the Finance Industry

Kirchler, Michael; Lindner, Florian; Weitzel, Utz

Research Question: Does the competition for rank (rank incentives) among financial professionals influence risk-taking differently compared to monetary tournament incentives?

Main Result: First, we find very strong rank-dependent behavior in the treatment where only the non-payment relevant ranking is shown. Professionals who are down in the ranking increase their risk-taking strongly compared to those being ahead. Second, imposing strong monetary incentives on the ranking in the tournament-treatment does not change behavior compared to the ranking-treatment.

Abstract: Rankings and social competition are pervasive features of the finance industry. Although rank incentives have no monetary consequences, they provide positive self-image and status. We recruit a unique subject pool of 204 financial professionals and investigate how rank incentives influence risk-taking. We find that payoff-irrelevant feedback on ranking strongly increases risk-taking. This applies to virtually all ranks, although particularly underperformers take the highest risks. Incentivizing the ranking monetarily does not change the rank-effect for professionals. In a comparison study with 432 students we find strong behavioral differences. We discuss regulatory implications and call for more experiments with professionals.

Kleinlercher, Daniel

On the provision of incentives in finance experiments.

Daniel Kleinlercher and Thomas Stöckl

Research Question: How do different incentive schemes influence subjects' behavior and consequently reported results?

Main Result: it depends

Abstract: The provision of monetary incentives is crucial to the interpretation of experimental results and an important procedural pillar in experimental economics since Vernon Smith published his "Induced value theory" in 1976. Despite the long tradition of studying questions related to finance and financial markets in the lab, this highly important methodological issue has not been studied in a systematic way. As a consequence, a wide variety of incentive schemes with distinct characteristics is currently applied in the literature. In this research project, we aim at shedding some light to this important issue and aim at providing guidance for design decisions in experimental finance studies. Therefore, we raise the following research questions:

RQ 1. Do the currently implemented schemes meet basic conditions the experimenter demands from an incentive scheme?

In RQ 1 we review and characterize currently used incentive schemes, highlight advantages and disadvantages of various schemes, and check whether these schemes meet some basic requirements. Most prominently, we evaluate incentive schemes according to their salience and analyze whether the induced salience is sufficient to motivate subject behavior according to the experimenters' intention (this issue is related to the flat-max problem). Furthermore, we analyze whether it is possible to estimate potential costs for the experimenter in advance. This analysis is of importance as (usually) experiments are expensive and experimenters' budgets constrained.

Our second research questions (RQ 2) examines whether the chosen unique experimental design drives the reported results or whether the implemented payoff scheme exerts some (unpredictable and undesirable) influence on the results. Despite the influence on in-study comparisons (treatment effects), this issue also concerns intra-study comparisons. Based on these considerations, we investigate how four distinct monetary incentive mechanisms affect the behavior of experimental subjects and thus (market) outcomes in three different experimental finance contexts.

RQ 2. How do different incentive schemes influence subjects' behavior and consequently reported results?

In a further step, we investigate how subjects perceive the implemented incentive scheme and ask the following question: Do subjects consider the incentive scheme as fair and just? If subjects do not perceive an incentive scheme as fair this might lead to negative effects i) directly in the experiment, and ii) to negative effects concerning the subject pool (lower future participation rates because subjects do not feel to have been treated in a fair way or their performance has not been treated in a fair way). So far, there is no data available on that issue or not analyzed sufficiently.

Experimental design – overview

To provide a broad picture, we implement three different types of financial experiments and four incentive schemes varied by their salience. See Table 1 for an overview. Two settings resemble a market environment while one setting is an individual decision experiment. The first market environment is based on the classical Smith et. al (1988, SSW) approach and connects to the vast literature on bubble experiments. The second market environment is based on Plott and Sunder (1988) and studies on the aggregation of diverse information in markets. The third experiment connects to the literature on individual investment decisions.

Table 1: Experimental Design - overview:

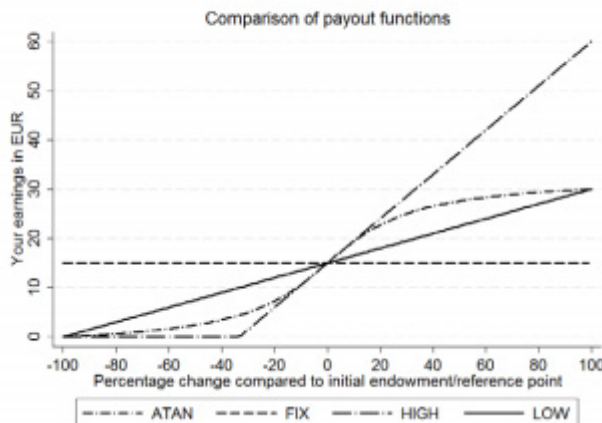
		Sensitivity of Payout Function			
		FIX	LOW	HIGH	ATAN
Experimental Finance Context	SSW	T1a	T2a	T3a	T4a
	Information Aggregation	T1b	T2b	T3b	T4b
	Investment Game	T1c	T2c	T3c	T4c

The four incentive schemes base subjects' payment solely on their performance in the experiment. We decided to eliminate some potential influence of initial endowments on subjects' behavior. The implemented schemes vary according to their salience, i.e. the sensitivity of payouts related to individual performance. Incentive scheme

FIX has zero sensitivity (no connection between performance and payout), incentive scheme LOW features some sensitivity while HIGH increases the sensitivity of LOW by a factor of three. As a fourth alternative, we suggest a new payoff function capable of dealing with the problem of potential losses or the flat-max problem (design ATAN). The four schemes are outlined in Figure 1.

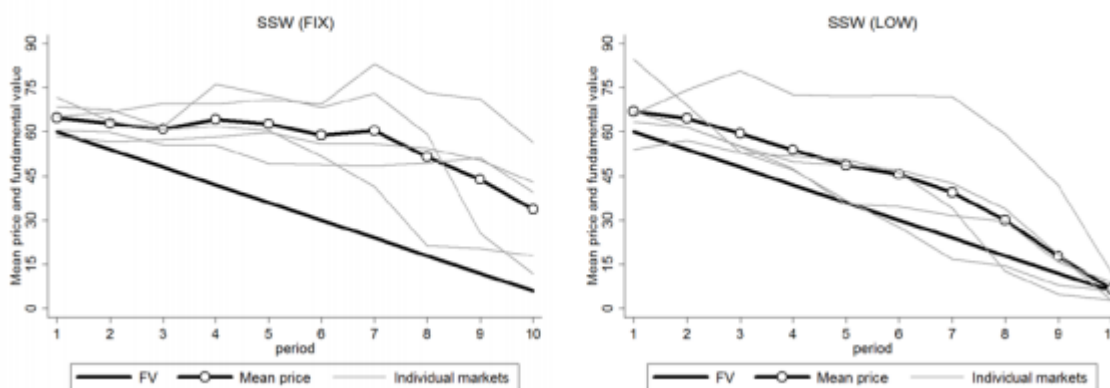
Our data analyses focus on three dimensions. First, we study the micro perspective, i.e., trading or decision behavior (conditional on risk preference). Second, we take the macro perspective and compare market outcomes, e.g., price efficiency, volatility, spreads. Third, we study how subjects perceive the payout function.

Figure 1: Comparison of payout functions



Up to now, we collected data from 20 markets in SSW (five in each treatment), 12 cohorts (48 oneperiod markets) in the information aggregation experiment, and 96 individual observations (24 per treatment) in the investment game. Figure 1 plots period-wise average transaction prices in the SSW experiment to provide an overview of price efficiency in these markets. These first results are promising but further analyses are currently under way. We are looking forward to helpful comments and discussion at the Experimental Finance Conference 2015.

Figure 1: Period-wise average transaction prices in the SSW experiment.



Klos, Alexander

Does short selling eliminate the price impact of behavioral biases in experimental markets?

Glaser, Markus; Klos, Alexander; Rottke, Simon; Schmidt, Peter

Research Question: Does short selling eliminate the price impact of myopic loss aversion in experimental markets?

Main Result: No, it does not

Abstract: This project studies whether behavioral biases at the individual level are more likely to influence market prices in the presence of short selling restrictions. We investigate the bias in experimental markets caused by myopic loss aversion because previous research reports market prices for a traded lottery above the expected value of the lottery. We use a difference-in-difference design that removes the necessity to

make assumptions about the fundamental value of the traded asset. Allowing for unrestricted short selling reduces prices to levels at or below the expected value but it does not eliminate mispricing.

König-Kersting, Christian

Good decision vs. good results: Outcome bias in financial agents' rewards

König-Kersting, Christian; Pollmann, Monique; Potters, Jan; Trautmann, Stefan T.

Research Question: Do principals take irrelevant outcome information into account when rewarding their agents for a risky investment decision with monetary consequences for the principal?

Main Result: Principals fall prey to the outcome bias. They take irrelevant outcome information into account but hardly use relevant information about the decision quality.

Abstract: We document outcome bias in a situation where an agent makes risky decisions for a principal, who may then monetarily reward him for his decision. If the outcome of the risky decision is unknown at the time rewards are chosen, we find rewards to be uncorrelated with the level of risk chosen by the agent. If the outcome is known, we observe significantly higher rewards when the outcome is favorable compared to when it is not. Furthermore, paid rewards are increasing in the amount put at risk if the outcome turns out favorable.

Highlights:

- Outcome bias in a risk taking task with ex-post accountability and monetary consequences for decision quality evaluators
 - Average rewards are higher if outcome of the risky decision is known to be favorable
 - In this case, higher investments in the risky asset also lead to higher rewards
-

Kouwenberg, Roy

Estimating Ambiguity Preferences and Perceptions in Multiple Prior Models: Evidence from the Field

Dimmock, Stephen G.; Kouwenberg, Roy; Mitchell, Olivia S.; Peijnenburg, Kim

Research Question: What are the ambiguity preferences and perceptions of the U.S. population?

Main Result: We find that ambiguity aversion is common for uncertain events of moderate to high likelihood involving gains, but ambiguity seeking prevails for low likelihoods and for losses. We show that choices made under ambiguity in the gain domain are best explained by the α -MaxMin model, with one parameter measuring ambiguity aversion (ambiguity preferences) and a second parameter quantifying the perceived degree of ambiguity (perceptions about ambiguity).

Abstract: We develop a tractable method to estimate multiple prior models of decision-making under ambiguity. In a representative sample of the U.S. population, we measure ambiguity attitudes in the gain and loss domains. We find that ambiguity aversion is common for uncertain events of moderate to high likelihood involving gains, but ambiguity seeking prevails for low likelihoods and for losses. We show that choices made under ambiguity in the gain domain are best explained by the α -MaxMin model, with one parameter measuring ambiguity aversion (ambiguity preferences) and a second parameter quantifying the perceived degree of ambiguity (perceptions about ambiguity). The ambiguity aversion parameter is constant and prior probability sets are asymmetric for low and high likelihood events. The data reject several other models, such as MaxMin and MaxMax, as well as symmetric probability intervals. Ambiguity aversion and the perceived degree of ambiguity are both higher for men and for the college educated. Ambiguity aversion (but not perceived ambiguity) is also positively related to risk aversion. In the loss domain, we find evidence of reflection, implying that ambiguity aversion for gains tends to reverse into ambiguity seeking for losses. Our model's estimates for preferences and perceptions about ambiguity can be used to analyze the economic and financial implications of such preferences.

Langnickel, Ferdinand

How not to measure overconfidence

Langnickel, Ferdinand; Zeisberger, Stefan

Research Question: Is the failure of experiments to confirm excessive trading of miscalibrated investors due to the elicitation technique of miscalibration?

Main Result: We find that the widely used confidence interval production task does not measure true miscalibration.

Abstract: Overconfidence was found to be a major bias in behavioral finance and is assumed to be a driver for investors' excessive risk-taking and trading. Behavioral models in finance claim that miscalibrated investors underperform in financial markets due to excessive trading activities (Daniel et al., 1998; Gervais and Odean, 2001; Odean, 1998). In fact, various empirical studies and supporting evidence for this prediction (Barber and Odean, 2000, 2001; Statman et al., 2006). However, experiments with individual investors fail to confirm the link between miscalibration and trading volume (Biais et al., 2005; Glaser and Weber, 2007; Kirchler, 2002). One explanation for these contradicting results lies in the elicitation technique for overconfidence in the form of miscalibration.

The most widely used method to measure overconfidence is the confidence interval production task (CIPT). In fact, all of the above studies use the CIPT to elicit individual miscalibration. In the CIPT decision makers provide range estimates for unknown values according to an assigned confidence level. The measure for miscalibration is obtained by comparing the assigned confidence level to the realized ratio of true values that fall within the provided ranges. We present the first study to systematically test if the proposed method is a valid measure for miscalibration.

We conduct two online experiments in Switzerland and the U.S. with 300 participants in total, including advanced finance students. The participants are randomly assigned to one of three different assigned confidence levels (30%, 60% or 90%). They complete a standard general knowledge question CIPT as used in previous studies on overconfidence (see, e.g. Biais et al., 2005) and provide self-reported overconfidence measures. For additional insights and robustness of our results, we further elicit potential behavioral drivers of hit rates such as risk taking behavior, numeracy, cognitive skills and the aversion to wide intervals.

We find strong evidence that the widely used overconfidence measure using the CIPT is very inappropriate to measure investors' overconfidence in the form of miscalibration. In both studies, participants in the 30% treatment appear perfectly calibrated while the ones in the 90% treatment are heavily overconfident (and the ones in the 60% somewhere in the middle). In other words, people are insensitive to their assigned confidence level. Hit rates which should range between 30% and 90% between treatments for perfectly calibrated participants, hardly differ at all between our three treatments (actual range between 33% and 41%). It appears that people rather respond to an individual level of confidence rather than an assigned one. The relative interval width turns out to be the main driver of hit rates. Besides, aversion to wide intervals as well as time spent and perceived difficulty also impact hit rates.

Our study addresses the missing link between financial theory and practice and it sheds light on supposedly contradicting results in the overconfidence literature. We provide an explanation why experimental studies fail to show excessive trading of miscalibrated people: The commonly used measure for miscalibration simply does not measure overconfidence in the form of miscalibration. These are important insights given how influential overconfidence is in the behavioral and experimental finance literature. We propose that different measures are to be used in the future to gain further insights into this important topic.

Li, King King

Familiarity Bias and Equity Home Market Bias Puzzle: Evidence from Laboratory and Field Experiments

Chew Soo Hong, Li King King, Jacob Sagi

Research Question: Can familiarity bias explain the equity home market bias puzzle?

Main Result: Home market bias can be due to familiarity bias.

Abstract: The equity Home market bias (French & Poterba, 1991) is the phenomenon that investors allocate disproportionately larger amount of their investment in domestic assets, and thus forgoing the benefits of diversification. It is often argued that investors exhibit home market bias because they have information advantage on local stocks. We propose an alternative hypothesis that the equity home market bias is connected with a commonly observed trait in decision making under uncertainty that we prefer to take risk from more familiar source of uncertainty (Fox & Tversky, 1995), hence exhibiting familiarity bias. We conducted two experiments to

test the hypothesis. In the first experiment, professional investors in Shanghai were asked to choose between betting on the more familiar Shanghai Stock exchange index or the less familiar Dow Jones index. In the second experiment, subjects were asked to form a portfolio by choosing from familiar and unfamiliar stocks. We found that subjects exhibited familiarity bias over almost objective events by preferring to take risk from the more familiar sources of uncertainty. These preferences are robust because individuals were willing to choose the more familiar sources even when the payoffs of these sources were dominated by the less familiar sources. The findings support the hypothesis that home market bias can be due to familiarity bias.

Li, Chen

The effect of learning on ambiguity attitudes: An experiment using initial public offerings on a stock market

Aurélien Baillon, Han Bleichrodt, Umut Keskin, Olivier L'Haridon, Chen Li

Research Question: n.a.

Main Result: n.a.

Abstract: This paper studies the effect of learning new information on decision under uncertainty. Using ambiguity models, we show the effect of learning on beliefs and ambiguity attitudes. We develop a new method to correct beliefs for ambiguity attitudes and decompose ambiguity attitudes into pessimism (capturing ambiguity aversion) and likelihood insensitivity. We apply our method in an experiment using initial public offerings (IPOs) on the New York Stock Exchange. IPOs provide a natural decision context in which no prior information on returns is available. We found that likelihood insensitivity decreased with information, but pessimism was unaffected. Subjects moved in the direction of expected utility with more information, but significant deviations remained. Subjective probabilities, corrected for ambiguity attitudes, were well calibrated and close to market data

Lindner, Florian

Hot Hand and Gambler's Fallacy in Teams: Evidence from Investment Experiments

Stöckl, Thomas; Huber, Jürgen; Kirchler, Michael; Lindner, Florian

Research Question: Do groups decide differently compared to individuals in selecting their investment or in relying on outside advice and are groups differently prone to behavioral biases such as the gambler's fallacy and the hot hand fallacy?

Main Result: We show that communication and group decision making do not impact subjects' overall proneness to the hot hand fallacy and to the gambler's fallacy. However, groups decide differently than individuals, as they rely significantly less on useless outside advice from "experts" and choose the risk-free option less frequently.

Abstract: In laboratory experiments we explore the effects of communication and group decision making on investment behavior and on subjects' proneness to behavioral biases. Most importantly, we show that communication and group decision making do not impact subjects' overall proneness to the hot hand fallacy and to the gambler's fallacy. However, groups decide differently than individuals, as they rely significantly less on useless outside advice from "experts" and choose the risk-free option less frequently. Furthermore we document gender differences in investment behavior: groups of two female subjects choose the risk-free investment more often and are marginally more prone to the hot hand fallacy than groups of two male subjects.

Lucks, Konstantin E.

Unleashing Animal Spirits - Self-Control and Overpricing in Experimental Asset Markets

Kocher, Martin; Lucks, Konstantin; Schindler, David

Research Question: How do reduced self-control capacities impact aggregate market outcomes and individual trader behavior?

Main Result: Bubbles are exacerbated in low self-control markets even with only 50% treatment (reduction in self-control). Traders low in self-control underperform in markets with relatively higher overpricing.

Abstract: One explanation for overpricing on asset markets is a lack of self-control abilities among traders. Self-control is the individual capacity to override or inhibit undesired behavioral tendencies such as impulses, and to refrain from acting on them. We implement the first experiment that is able to address a potential causal relationship between self-control abilities and systematic overpricing on financial markets by introducing an

exogenous variation of self-control abilities. Moreover, our experimental treatments seek to detect some of the channels through which individual self-control problems could transmit into irrational exuberance on the aggregate level. We observe a strong and causal effect of self-control abilities on market overpricing. Low self-control traders are associated with significantly larger levels of overpricing, and they earn significantly less on exuberant markets as a consequence of holding assets for too long.

Luhan, Wolfgang J.

Limited Liability: A clash of social and egoistic preferences in financial decision making for others

Füllbrunn, Sascha; Luhan, Wolfgang J.

Research Question: If money managers take higher risks for others than for themselves, is this due to convex incentive schemes?

Main Result: Monetary incentives for risky investments in a limited liability setting destroys the social responsibility motive when making risky decisions for others.

Abstract: On financial markets, investors usually put an agent in charge of his risky investments. During the financial crisis of 2007-2008 this practice in the financial sector became the subject of a continuing public as well as a scientific debate as it was perceived to lead to excessive risk taking. But is this excessive risk taking due to certain compensation schemes or do money managers act in the interest of the clients even without a return-dependent compensation? In this paper we experimentally compare risk taking for others in a situation with convex incentives for the money manager (limited liability) and in a situation without pure social incentives. The question of whether money managers will actually take higher or lower risks for their clients than when investing for themselves depends on a twofold incentive structure.

On the one hand, his monetary payoff depends solely on the return on investment. In particular, he earns a fraction of his clients revenues while potential losses are incurred solely by his clients. The standard theoretical prediction for perfectly rational and egoistic money managers, in such a “limited liability” environment, would be to choose investments with the highest possible returns, irrespective of potential losses.

On the other hand, the responsibility for a third party might trigger several psychological effects. According to the “psychological self-other distance” in which the evaluation of a potential loss in a risky situation is decreasing in the distance to the decision maker. This finding is linked to results from economic experiments [Harrison2006, holt2002risk], where risk aversion is significantly decreased in hypothetical situations without real consequences. A perfectly egoistic money manager might, even in absence of individual monetary incentives, accept higher risks as the the situation bares no relevance for his payoff. In contrast, [charness2009role] propose “responsibility alleviation” as an explanation for a cautious shift. According to this theory, taking responsibility for a third party's welfare induces pro-social behavior which results in conservative risk.

These two opposing incentives, limited liability and social responsibility for the clients, need to be separated in a systematic approach to study whether investment decisions for others will result in higher or lower risk taking than for oneself. If money managers on real-world financial markets actually do take higher risks for others than for themselves, do monetary incentives crowd out responsibility motives, or would they take higher risks for others in the first place.

The first step to answer this question is to isolate social responsibility from monetary incentives for the money manager. There is a small, yet growing body of experimental literature focusing on risky decisions on behalf of others when there is no incentive for the decision maker (an overview can be found in [FullbrunnLuhan2014]). While the results are mixed, ranging from a risky shift, i.e. money managers take a significantly higher risk for others than for themselves to, a cautious shift, i.e., money managers take significantly lower risks for the clients than for themselves the authors of this study have found clear indication for a shift depending on the money managers relative risk preference.

In [FullbrunnLuhan2014], an individual decision maker (“the money manager”) faces a risky investment situation similar to Gneezy and Potters (1997). In three treatments the money manager either invests only for himself, only for a group of six clients without any monetary relevance for himself (no payoff alignment), or he invests an equal amount for the clients and for himself (payoff alignment). The aggregate results indicate investment behavior to be in line with responsibility alleviation as the money managers invest significantly less when clients bear the consequences even when the money manager is a part of the investors group himself. This aggregate result, however, is purely driven by money managers with low levels of risk aversion. Money managers with high levels of risk aversions, [FullbrunnLuhan2014] find indications for a risky shift. Apparently, when making decisions for others the money managers try to act according to the clients' risk preferences. In the case of payoff alignment, the difference between his own risk preference and the perceived risk preferences of the group determines the decision.

Accepting social responsibility as the main motivation in situations without monetary incentives as established,

the second step is to examine whether monetary incentives will crowd out social responsibility.

Building upon the design of [FullbrunnLuhan2014] we introduce an incentive scheme with limited liability - convex incentives - for money managers to study what extent of profit based rewards necessary to overrule the social preferences of money managers.

We consider the [gneezy1997experiment] investment game in three treatments. In treatment OTH, the money manager makes the decision for six clients simultaneously and earns a zero payoff. In treatment LIM0.05, we slightly manipulate the OTH treatment by paying the money manager five percent from each client's gains from investment. And in treatment LIM0.5 we increase the percentage from five percent to 50 percent. Additionally, each money manager makes a decision for himself to be able to evaluate what the money managers is willing to invest for himself.

The experiment was conducted at the Ruhr University Bochum experimental laboratory using the software z-Tree. In each treatment, the subjects entered arbitrary investment levels and the computer showed a list with the investment levels, the own payoff and the clients payoff in case of a loss and in case of a win. Find a short description on how subjects decided in the online supplement. Then subjects chose one investment level from the generated list.

We administered a within-subject design as subjects made their decision in each of the three treatments. We gathered a total of 133 observations, the average payoff was 17.6 € (max. 34.5 €, min. 3 €) for an average duration of 35 minutes.

We find that monetary incentives for risky investments in a limited liability setting destroys the social responsibility motive when making risky decisions for others. The LIM treatments induce a significant increase in risk taking, fully crowding out the cautious shift in OTH. However, in terms of payoffs, the limited liability treatments lead to an efficiency gain. As the expected return from the risky investment is strictly positive, the risk neutral optimum is full investment. With a low profit share for the money manager, the clients earn significantly more as compared to the situation when investing for themselves.

Lukas, Moritz

Individual Preferences and the Exponential Growth Bias

Königsheim, Christian; Lukas, Moritz; Nöth, Markus

Research Question: Do utility curvature and time preferences influence measures of the exponential growth bias?

Main Result: Ignoring utility curvature and time preferences results in biased estimates of the exponential growth bias.

Abstract: The exponential growth bias (EGB) is a widely observed phenomenon in savings, investments, and other financial domains. We propose a new experimental design based on multiple price lists to elicit the existence and magnitude of the bias. In contrast to other studies, our method is based on actual intertemporal decisions and simultaneously elicits time preferences and subjects' utility curvature. We first find that consistent with the EGB, individuals are measured as overly impatient when their information about future payoffs is given by the periodical interest rate only. Second, using structural estimation, we show that estimates of the existence and magnitude of the EGB are biased if the curvature of the utility function and time preferences are ignored. We argue that these findings are especially important when policymakers attempt to extrapolate evidence from specific studies to the general population.

Mari, Konstantina

Optimal timing of exercising a financial option contract under an experimental framework

Mari, Konstantina

Research Question: Do people exercise optimally a financial option contract?

Main Result: Work in Progress

Abstract: There are not many experimental studies related to the option pricing theory. There are rather more studies in the option markets than in the individual pricing decisions of option contracts. Abbink and Rockenbach (2006) designed an individual decision option pricing experiment in which they compared the results between professionals and students. Students seemed to perform better due to the less technical and more intuitive approach by the professional traders. The experiment was based on the famous binomial model by Cox et al. (1979) in discrete time. There is also another paper by Shavit et al (2010) on the evaluation of options on

lotteries. In this paper the authors compare the decisions of the subjects of buying and selling lotteries with those of buying and selling call/put/insurance options on these lotteries. Our study concentrates on the optimal decision time to exercise a call option contract. In contrast with the paper of Abbink and Rockenbach (2006), we work in continuous time.

We hold an option contract on a financial asset, e.g. a stock, whose value is S and evolves stochastically based on the following Ito's drift-diffusion process:

$$dS = \mu S dt + \sigma S dB \quad (1)$$

where μ and σ are constant non-negative numbers.

Equation (1) represents a stochastic differential equation (SDE) where μ is the trend of the stock price, σ is the volatility of the stock price and dB is the increment of the Wiener process. More specifically, the increment of the Wiener process is:

$$dB_t = \epsilon_t \sqrt{dt} \sim N(0, dt) \quad (2)$$

where dt is a very small positive number, close to zero and ϵ_t is a random variable which follows a $N(0, 1)$.

Based on the SDE of equation (1), we find the optimal time or more precisely the optimal value of S in order to exercise the option. We want to exercise the option when the value of it, $F(S)$, is equal to the maximum expected present value of the profit of acquiring the financial asset:

$$F(S) = \max E[(ST - K)e^{-\rho T}]$$

where E is the expectation, ST is the value of the underlying asset at the optimal time of the investment T , K is the strike price that the owner of the contract pays on exercising the option and ρ is the discount rate.

We do not obtain any profits before exercising the option. However, there is a gain from holding the option alive and not exercise it. This gain is the investment opportunity that the option offers and its expected present value capital estimation. As long as the S is not the optimal one to exercise the option, the Bellman equation is the following:

$$\rho F dt = E(dF)$$

Therefore, the expected return of the option in a time interval dt is equal to its expected present value of capital estimation.

By applying the Taylor Series on the derivative of the option value, we get:

$$dF = [\mu S F'(S) + \frac{1}{2} \sigma^2 S^2 F''(S)] dt$$

Therefore, the Bellman equation is:

$$\rho F dt = [\mu S F'(S) + \frac{1}{2} \sigma^2 S^2 F''(S)] dt \rightarrow$$

$$\frac{1}{2} \sigma^2 S^2 F''(S) + \mu S F'(S) - \rho F = 0$$

Based on the above and due to the fact that the investment opportunity $F(S)$ must also satisfies the following three Boundary Conditions:

- 1) $F(0) = 0$
- 2) Value-Matching Condition:
 $F(S^*) = S^* - K$
- 3) Smooth-Pasting Condition: $F'(S^*) = 1$

we obtain that the solution of the option value is of the following form:

$$F(S) = AS^{\beta_1}$$

By using the Value-Matching and the Smooth-Pasting Conditions, we obtain that the optimal stock price trigger is:

$$S^* = \frac{\beta_1}{\beta_1 - 1} K$$

By taking the value-matching condition, we get the value of the option at the critical value S^* :

$$F(S^*) = S^* - K = \frac{\beta_1}{\beta_1 - 1} K - K = K \left(\frac{\beta_1}{\beta_1 - 1} - 1 \right) = \frac{1}{\beta_1 - 1} K$$

Based on the above theory, the optimal is an individual to exercise the option when the value S of the stock price reaches the value S^* . We plan to test if the subjects think strategically and exercise their call option contract at this optimal point or if they are naïve and they just invest after reaching the exercise price K . The fact that we work in continuous time involves some difficulties which researchers do not encounter when they work in discrete time. In reality we cannot keep the subjects in a laboratory forever. Thus, we assume a random stopping point in the evolution of the stock price. It is also difficult to explain Brownian motion to the subjects. Therefore, apart from the instructions that the subjects will read, we plan to ask the subjects to repeat enough times the experiment before the experiment starts officially in order to make them feel familiar with the problem and understand it better. We need also to choose very carefully the parameters by performing a sensitivity analysis firstly and take into consideration the different preferences of people. For example, we should consider carefully which the effect is when the trend μ of the stock price is positive in combination with the other parameters. Thus, in the case that μ is positive and the discount factor of the subject is zero, we realize that he should stop immediately, while if the discount factor is one, the subject should wait forever. We have built the main interface of the experiment by using the software Python. The subjects can choose to exercise the option if they want. Some pictures of the interface follow. There are also some other options, however as this is work in progress, we are still thinking if there will be other choices that the subject could choose related to the option contract.

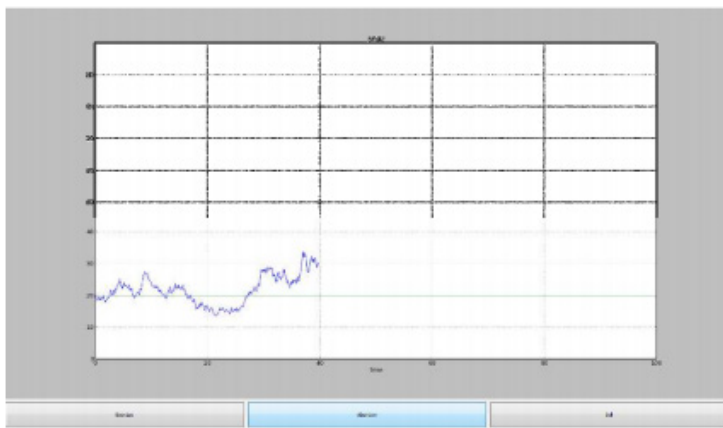


Figure 1

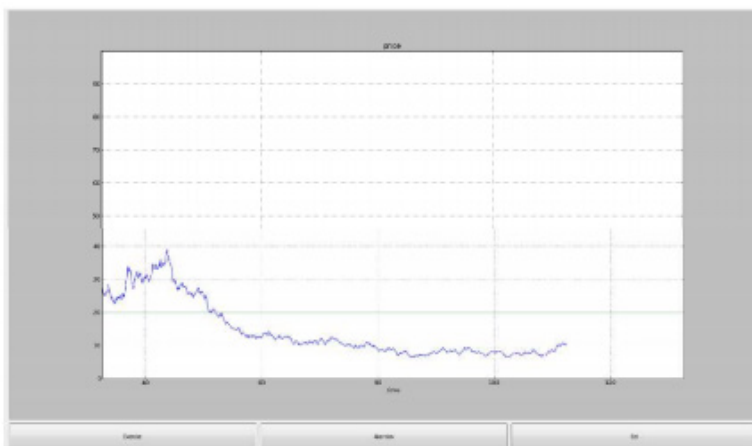


Figure 2

In the above pictures we can see the exercise price with the green line and the evolution of the stock price with the blue line. In the case that the random stopping point has not come up to the end of the visible horizon in Figure 1, the graph “is moving” (see Figure 2).

Massenot, Baptiste

Predictably irrational: Gambling for resurrection in experimental asset markets?

Sascha Baghestanian, Baptiste Massenot, Ferdinan von Siemens

Research Question: Are there predictable components in irrational behavior in asset markets which contribute to mis-pricing?

Main Result: Yes. We observe an interplay of gambler's fallacy and gambling for resurrection motives, which can generate bubble-crash patterns if the Cash-to-Asset ratio is sufficiently high.

Abstract: Asset price bubbles are frequently attributed to irrational behavior. The underlying behavioral biases that can lead to mis-pricing are, however, still not well understood. We design an experimental asset market in which bubbles cannot originate from the rational response to expected capital gains since assets last for one period. To minimize the potential role of irrationality, we further assume an exogenous asset supply, idiosyncratic rather than aggregate shocks and a credit market frame that is less loaded with boom-bust associations. Even so, we find that asset prices are initially above the fundamental value and then crash. Furthermore, our results suggest that the bubbles do not result from noisy trading but from a predictable desire to gamble for resurrection. Following larger losses, subjects want to break even and are willing to take more risk. Asset prices increase as a result and so do losses. At some point, budget constraints break this vicious cycle and initiate the crash.

Meissner, Thomas

Intertemporal Consumption and Debt Aversion: An Experimental Study

Meissner, Thomas

Research Question: Are people debt averse?

Main Result: People are debt averse

Abstract: This paper tests how subjects behave in an intertemporal consumption/saving experiment when borrowing is allowed and whether subjects treat debt differently than savings. Two treatments create environments where either saving or borrowing is required for optimal consumption. Since both treatments share the same optimal consumption levels, observed consumption choices can be directly compared across treatments. The experimental findings imply that deviations from optimal behavior are higher when subjects have to borrow than when they have to save in order to consume optimally, suggesting debt aversion. Significant underconsumption is observed when subjects have to borrow in order to reach optimal consumption. In line with previous experiments, weak evidence is found suggesting that subjects over-consume when saving is necessary for optimal consumption.

Meloso, Debrah

The Mechanics of Reputational Cheap Talk: An Experiment with Crystal Balls

Meloso, Debrah; Ottaviani, Marco

Research Question: Does theory correctly predict when there will be under-communication in strategic communication settings with reputation concerns (e.g., financial analysts' incentives)?

Main Result: Theory correctly predicts the behavior of the informed parties (reporters) in environments where the uninformed parties (evaluators) are sufficiently predictable. In noisier settings there is a preference for strategies leading to more predictable and rationalizable reactions of evaluators

Abstract: The paper develops an experimental test of a baseline model of strategic communication by a reporter who wants to convince an evaluator of being well informed. Variants of this model lie at the basis of the study in Finance and Economics of the incentives of financial analysts (Trueman, 1994, and Graham 1999) and strategic forecasters (Herbeck and Waldmann, 1996, Lamont, 2002, and Ottaviani and Sorensen, 2006), as well as the study of reputation management in managerial decision making (Scharfstein and Stein, 1990, and Prat, 2005). In applications it is taken for granted that reputational concerns will have a significant detrimental effect on the spreading of information, while in the experimental study of cheap talk and herding models it is often found that there is more honest information sharing than predicted by theory (Dickhaut et al. 1995, Cai and Wang, 2006). When the incentives to blur information stem from reputational considerations, will the blurring occur or will there be more communication than theoretically predicted also in this case?

We anatomically dissect strategic behavior in the baseline model of reputational cheap talk through a number of treatments that control for the beliefs of, as well as learning by, the evaluator. The evidence we find is broadly

consistent with reporters best replying to fixed beliefs by evaluators. When we control for learning by evaluators, the amount of misreporting is again broadly consistent with theoretical predictions. However, human evaluators find it difficult to assess the informativeness of reports and to learn the strategies played by reporters. In turn, when interacting with human evaluators, reporters end up misreporting more than predicted by baseline equilibrium theory. We find no evidence of over-communication. Instead, our findings support the prediction of theory that information will be lost or blurred more often than not.

In designing our experiment we introduce several innovations to deal with the complexity of the underlying theoretical model. First, we implement the model's information structure, with urns of nested balls, extending the counting heuristic for Bayesian updating to settings with three jointly distributed random variables (see Anderson and Holt, 1997, for the setting with two jointly distributed random variables). We manage to explain all the risk present in the experiment via the drawing of one ball from one out of two urns (informative urn or uninformative urn), by using balls with two features: an outer shell (signal) and an inner core (state). The second innovation is the Exton-Beta learning model we propose and program for the learning of evaluators within our setting. In order to control for the learning of evaluators, we have one treatment where these evaluators are computerized and learn about the behavior of the (human) reporters they interact with, using a simple yet rational learning model. Adding such a controlled setting proved crucial for the interpretation of results in the treatment with humans evaluators.

Nadler, Amos

Testosterone and Trading: A Biological Driver of Asset Mispricing

Nadler, Amos; Jiao, Peiran; Alexander, Veronika; Johnson, Cameron; Zak, Paul

Research Question: How does testosterone affect buying and selling of financial assets and what is the effect on equilibrium prices?

Main Result: Testosterone increases bidding prices and causes asset prices to increase far above their universally known intrinsic values.

Abstract: Traditional finance theories state that asset prices are determined by firm fundamentals, such as per-share earnings and relative risk. However, a growing body of literature shows prices often do not reflect underlying value and are largely formed by expectations of future cash flows that are discordant with financial fundamentals and are vulnerable to cross-sectional sentiment influences. This paper demonstrates asset mispricing by a biological driver of competitive bidding — testosterone — in experimental asset markets. We show that testosterone drives competitive bidding leading prices to dissociate from fundamental value, producing larger and longer-lasting bubbles. Further, testosterone reduces trading performance and increases trader overconfidence.

Neugebauer, Tibor

A test of the Modigliani-Miller invariance theorem and arbitrage in experimental asset markets

Charness, Gary

Research Question: Do we find support for the Modigliani Miller theorem in asset market experiments?

Main Result: For empirical validity of value invariance it is necessary to assume perfect positive correlation of asset returns, with no limits to arbitrage.

Abstract: In their seminal paper, Modigliani and Miller (1958) showed mathematically that the market value of the firm is invariant to the firm's leverage; different packaging of contractual claims on the firm's asset returns has no impact on the total market value of the firm's debt and equity. The Modigliani and Miller (1958) – henceforth MM – value-invariance theorem and the proof's no-arbitrage requirement suggest the prevalence of the law of one price. But due to its assumption of perfect capital markets and the no-arbitrage condition, which requires perfect positive correlation of asset returns, the MM theorem has yet to be tested in a satisfactory manner on real-world market data and thus its empirical significance has been unclear. Nevertheless, such a test is feasible in the laboratory, and providing an empirical test of the MM theorem is a particular purpose of this laboratory study. Since perfect return correlation is rare in naturally occurring equities, we also check how limits of arbitrage affect the empirical validity of the MM theorem with regards to cross-asset pricing. In particular, we address the question if a perfect positive correlation between asset returns is necessary for empirical validity of value invariance or if the same expected (instead of identical) future return is sufficient. The data indeed suggest that perfect correlation is necessary for the law of one price to prevail.

Our design follows the standard line of experimental asset markets research of Smith, Suchanek and Williams (1988), featuring multi-period cash flows, zero interest rates, and a repetition of markets with experienced

subjects. However, in contrast to the standard, single-asset market approach of Smith et al. and in line with MM, we have simultaneous trading taking place in two shares of the same “risk class”. These twin shares are perfect substitutes as their underlying uncertain future cash flows are perfectly correlated (or uncorrelated, in a second treatment). However, the stream to shareholders of the A-share and the B-share differs by a constant amount, i.e., the synthetic value of debt as discuss below. Owing to our implementation with zero interest rates, the A-share and B-share can represent accounting “leveraged” and “unleveraged” equity streams. By comparing the market prices of our shares, we thus present a very simple test of the MM theorem. At any point in time when the price deviates from parity, in other words if the difference between the twin shares differs from the synthetic debt value, each market participant can exploit the price discrepancy. Since short-selling and borrowing is costless a trader can make a riskless arbitrage gain by homemade leveraging or unleveraging. Exploited arbitrage opportunities thereby undo the divergence of market values.

Our data provide support for the MM theorem as average prices are close to parity, even though some price discrepancies and deviations from the risk-neutral value seem to persist throughout the experiment. We test the robustness of our experimental setup in view of the pricing parity result in a control treatment. Besides the perfect correlation treatment with twin shares we consider independent draws of dividends of the two simultaneously traded shares in our control no-correlation treatment. Here, A-share and B-share have the same fundamental value and idiosyncratic risk as in the perfect correlation treatment, but there are limits to arbitrage since an asset swap is risky. Comparing pricing between treatments we find a clear treatment effect as in most of the markets of our no correlation treatment we have that the (leveraged) A-share is less highly priced than the (all-equity) B-share, suggesting a risk premium.

We also measure a higher level of price discrepancies in the no-correlation treatment. With perfect correlation our measures of cross-asset price discrepancy and deviation from fundamental value indicate smaller deviations from the theoretical benchmarks than in the no-correlation treatment. Hence, although an arbitrage-equilibrium cannot be supported in absolute quantitative terms, our data provide qualitative support for the equilibrium. That said, as with evidence observed with experienced subjects in single asset market studies (e.g., Haruvy, Lahav, and Noussair 2007; Dufwenberg, Lindqvist, and Moore 2005), the price deviation from fundamental values declines in consecutive markets in both treatments. The movement towards the theoretical benchmarks, nonetheless, seems to be faster in the perfect-correlation treatment than in the no-correlation treatment, both in decline of price discrepancies and in deviation from fundamental value. Nevertheless, some potential price discrepancies persist in both treatments, even with experienced subjects, probably due to noise (Shleifer and Summers 1990).

We investigate the impact of traders’ acuity as measured by the Cognitive Reflection Test (CRT; Frederick, 2005) on the level of arbitrage, as the literature suggests that smart traders search and eliminate price discrepancies. Our measure correlates with the reduction in price discrepancy on the overall sample. While there are some price discrepancies in markets with overall high trader aptitude, these are substantially less common and smaller.

More generally our study contributes to the small experimental literature that tries to evaluate the market’s ability to reduce or eliminate arbitrage opportunities. The observation of persistence in price discrepancies confirms earlier empirical results. O’Brien and Srivastava (1993) replicate portfolios of options, stocks and cash in a multiple-asset experimental market with two stages and information asymmetries. The authors report that if the information asymmetry cannot be resolved, price discrepancies frequently persist. Froot and Daborah (1999) study cases with frictions of Siamese twin shares that are traded in different real world exchanges; they report long-lasting deviations from parity in pricing, creating limited potential for arbitrage since significant risks persist. A related result with limits to arbitrage is reported in Lamont and Thaler (2003b); in corporate carve-outs the authors find that the market value of the sum of the parts deviates significantly from the market value of the entire company (see also Gromb and Vayanos 2010).

Oliven and Rietz (2004) investigate the data of the 1992 IOWA presidential election market (IEM), a large-scale experiment that went on for several months over the Internet. Arbitrage opportunities in this market are quite easy to spot; if the value of the market portfolio deviates from 100% of the issue price, any trader can make an arbitrage gain by selling or buying at the issue price. Oliven and Rietz report a substantial number of price discrepancies, but find that these are quickly driven out. Rietz (2005) reports on a laboratory prediction market experiment with state contingent claims. Similarly to the IEM, arbitrage opportunities are easily spotted, but trading is over 100 minutes rather than 100 days. Rietz concludes that the market left to itself is prone to violate the no-arbitrage requirement. If, as in one treatment, the experimenter automatically eliminates each price discrepancy, this automatic arbitrage is involved in most trades in the experiment. Rockenbach and Abbink (2006) reported that, even after hours of experience, both students and professional traders left arbitrage opportunities unexploited in an individual investment allocation task of cash to options, bonds and stock.

Levati, Qiu, and Mahagaonkar (2012) propose the only other available experimental study to test the MM theorem. Their design forecloses any arbitrage possibility or homemade leveraging and unleveraging. Levati et al. examine evaluations for eight independent lotteries with varying degree of risks in a sequence of experimental single-asset call auction markets, where the risks represent different levels of company leverage. In line with our results obtained in the no-correlation treatment, their results indicate a risk premium on leveraged equity capital. In contrast to our perfect-correlation treatment, the market data in Levati et al. show no support for value

invariance. The authors acknowledge as potential reason the foreclosure of any arbitrage possibility.

Our paper contributes to the financial economics literature by testing the MM invariance theorem under conditions of perfect correlation (versus no correlation). We thus provide evidence on how limits to arbitrage impact value invariance. Our main contribution is that we are able to empirically validate value invariance under perfect correlation. The observation of a treatment effect is also an important contribution of our paper: price discrepancies in the market change when one moves from perfect correlation to no correlation. Finally, we observe that high trader acuity significantly reduces the price discrepancy in the market and shares trade closer to fundamentals.

Nicklisch, Andreas

hroot - Hamburg registration and organization online tool

Olaf Bock, Andreas Nicklisch, Ingmar Baetge

Abstract: hroot (Hamburg Registration and Organization Online Tool) is a web-based software designed for managing participants of economic experiments. This package provides important features to assure a randomized invitation process based on a filtered, prespecified subject pool, and a complete documentation of the selection procedure for potential participants of an experiment. It offers detailed statistics, subject pool filtering, and an internal calendar.

Noussair, Charles N

An Experimental Asset Market with a Random Walk

Charles N. Noussair, Steven Tucker, and Mark Ryan

Research Question: Are there asymmetries in behavior between markets with increasing vs. decreasing fundamental value trends in markets following a random walk?

Main Result: There are differences with respect to the trends, and specific experience is important

Abstract: Twenty-seven experimental sessions were conducted at Waikato University. A total of 270 participants were recruited. Participants engaged in three separate markets, but only one market was randomly selected for payment at the end of the session via the public rolling of a die by one of the market participants. In each session, ten participants have the opportunity to trade an asset with a life of 10 periods in a continuous double auction. At the end of a market, the experimenter buys back all assets in the participants' inventory. The price paid for each asset equals 50 Taler (the experimental currency unit) plus a random draw that occurs at the end of each period. The random draws are independent and drawn from a two-point distribution of +5 or -5 Taler with equal probability. Therefore, the expected value of each draw is zero. The asset's expected fundamental value in a given period is calculated as $FV_t = FV_{t-1} + X_t$ where $X_t \in [-5, 5]$, and $t \in [1, \dots, 10]$ and thus follows a discrete random walk of $50 + \sum_{t=1}^{10} X_t$ where $X_t \in [-5, 5]$.

The experiment consists of four treatments. Sessions within a treatment consist of a series of markets with varying trends of the fundamental value. There are three different types of fundamental value trend, i.e. Sideways, Upward and Downward. In the Sideways trend, the ending fundamental value is equal to the starting fundamental value, i.e. 50 Taler. More specifically, the series of random draws are such that the initial fundamental value is the same as the ending fundamental value. Upward trend involves a series of random draws such that the ending fundamental value is 70 Taler, i.e. 20 Taler greater than the initial fundamental value. Lastly, the Downward trend has an ending fundamental value of 30 Taler, and thus the series of random draws result in a decrease in the fundamental value of 20 Taler. A random number generator was used to create the trends. Treatment 1 consists of three sequential sideways trend markets. Treatment 2 consists of two markets with an Upward trend followed by one with a Downward trend. Treatment 3 is a mirror pattern of Treatment 2.

In treatments 1-3, we impose an initial cash to asset ratio (C/A ratio) equal to one. More specifically, at the beginning of each market, half of the participants are endowed with 20 assets and 3000 Taler and the other half are endowed with 60 assets and 1000 Taler. Given the initial fundamental value of 50 Taler, the initial net wealth across all participants is 4000 Taler. Treatment 4 consists of six sessions that are identical to treatment 1, i.e. except we impose an initial C/A ratio of 20. More specifically, half of the participants are endowed with 20 assets and 41000 Taler and the other half are endowed with 60 assets and 39000 Taler. Therefore, the initial net wealth across all subjects is 42000 Taler.

Data was also collected on participants' understanding of the fundamental value process. More specifically, three salient quizzes were conducted per session, one at the end of each market. Each quiz is comprised of three questions. If a participant answers all questions within a survey correctly he/she received \$2. The questions

tested for a numeric understanding of the fundamental value of the asset, including maximum and minimum future bounds of the possible price paths, and the expected gain or loss a trader would make by arbitraging an asset at a certain price against a given fundamental value. Furthermore, at the start of each session, a Cognitive Reasoning Test (CRT) was conducted.

Upon completion of the quiz and the CRT, participants were provided the market instructions, and were allowed 15 minutes to read them on their own. A verbal description of the main features of the market experiment followed, and the participants were encouraged to privately ask any questions they may have. Two practice rounds, which did not contribute to their earnings, were completed, after which the endowments were reinitialized and markets started.

We test eight hypotheses:

Hypothesis 1: Participants will improve their understanding of the fundamental value process as they become more experienced between markets.

Hypothesis 2: Mispricing decreases as participants gain experience.

Hypothesis 3: The level of price efficiency is the same between Treatments 2 and 3.

Hypothesis 4: Higher comprehension scores are positively correlated with overall earnings.

Hypothesis 5: A participant's CRT score is positively correlated with overall earnings.

Hypothesis 6: A participant's CRT score is positively correlated with comprehension score.

Hypothesis 7: A participant's CRT score is positively correlated with greater increases in comprehension scores as subjects gain experience.

Hypothesis 8: Average trader cohort CRT score is positively correlated with mispricing.

The data show that prices adjust insufficiently slowly to shocks, that market prices track fundamentals more closely when the trend is decreasing rather than increasing, and that greater cash increases prices. Both cognitive reasoning and understanding of the fundamental value process are correlated with individual performance.

O'Briain, Tomas

Learning and loss aversion: Evidence from a financial betting experiment

Tomas O'Briain

Research Question: Do agents subject to a strong reinforcement treatment exhibit loss aversion as predicted by prospect theory?

Main Result: In a pilot experiment, we find some support for the hypothesis that strong reinforcement mitigates the disposition effect.

Abstract: Odean (1998) provides evidence that investors readily realise paper gains by selling their winning stocks, yet hold on to their losing stocks too long. This loss aversion is consistent with Kahneman and Tversky (1979) prospect theory, however, would an investor behave this way if he or she were subjected to strong reinforcement? How long would the investor hold on to a stock that is losing value on a day-to-day basis? Conversely, would an investor rush to sell a stock that has yielded positive returns in each month during the past year? We test the interaction between learning and loss aversion in a financial betting experiment. Our two treatment groups are subjected to consecutive gains or losses. We find that reinforcement learning may mitigate the disposition effect in this setting.

Ortmann, Andreas

Testing dashboards for default superannuation funds experimentally

Hazel Bateman, Isa Dobrescu, Ben Newell, Andreas Ortmann (all UNSW), Susan Thorp (University of Sydney)

Research Question: n.a

Main Result: n.a.

Abstract: The present experiment continues our earlier experimental evaluation of mandated product disclosure.

The target of our present investigation is the so-called dashboard for MySuper, a default superannuation fund (pension fund) that is designed, or at least intended, to be a low-cost default single diversified investment option with simple features (see <https://www.moneysmart.gov.au/superannuation-and-retirement/how-super-works/choosing-a-super-fund/mysuper>.) The dashboard is meant to allow superannuation members to compare various MySuper options, with the expectation being that competition will discipline potential abuses.

We have tested the existing templates in three treatments and so far have found that people can respond to fee information in sensible ways because it presents clear, salient, and interpretable signals. In contrast, people have considerable trouble with returns information which tends to be noisier and in any case may be the kind of information that they are sensibly sceptical about. After all, past performance is no guarantee of future returns.

While our testing so far has taken existing templates as point of departure, we are currently in the process of testing simplified, coherent alternatives that should reduce effort. All our tests are incentive compatible and we employ a random sample of the Australian population in all our treatments.

Palan, Stefan

Catch me if you can. Can human observers identify in-siders in asset markets?

Stöckl, Thomas; Palan, Stefan

Research Question: Can human observers identify insiders in asset markets?

Main Result: Yes, they can.

Abstract: Securities regulators around the globe face the challenge of identifying trades based on inside information. We determine human observers' ability to identify informed traders and investigate which trading patterns are indicative of informed trading using experimental asset markets. We furthermore test how the behavioral response of informed traders to the threat of detection and punishment impacts observers' detection abilities. We find that market trading data carries information allowing for the identification of informed trading. Observers partly succeed in recognizing and using this information to identify informed traders.

Papadovasilaki, Dimitra

Absent-minded Investors and their effect on financial and macroeconomic cycles

Dimitra Papadovasilaki , James Sundali , Federico Guerrero

Research Question: What is the effect of financial shocks on subsequent investment behavior?

Main Result: Experiencing a bust early in the investment cycle leads in holding less of risky assets and vice versa

Abstract: This research concerns the effect of early and salient experiences on financial behavior in general, and on asset allocation decisions in particular. In this paper we complement the incipient literature on the issue (Giuliano and Spilimbergo 2013; Bucciol and Zarri 2013; Papadovasilaki et al. 2014) and present the results of three experiments designed to assess the impact of salient and early risky asset returns on subsequent investment decisions. More specifically, this study addresses how and why repeated decisions such as how to allocate assets in a portfolio are impacted by the outcomes of prior investment events. Our findings show that subjects that experience a market bust early in the investment lifecycle invest less in risky assets compared to subjects that experience market booms. Two mechanisms are identified to account for the effects of early and salient experiences, namely changes in subjects' beliefs about future stock market returns, and changes in subjects' risk aversion. The motivation of the paper is based on the fact that asset markets continually cycle through periods of irrational exuberance followed by severe crashes. As the debt market crash of 2008 has shown, financial market crashes can have large and negative effects on the real economy. We believe that a systemic and causal understanding of investor behavior over investment cycles in a controlled laboratory setting can provide insights to better understand and manage investor behavior before, during and after market manias and busts.

Paserman, Michal

Adaptive Investment Strategies during Financial Crises: An Experiment with Financial Professionals

Michal Paserman

Research Question: How do investors adapt decision making strategy during financial crises?

Main Result: I find that under pressure, investors shift from strategies consistent with expected utility maximization to ones in which they reduce information processing. Even when they have enough time to search all relevant information, when facing a financial crisis, investors focus on a selective subset of negative bond aspects, neglecting other relevant information. I suggest that this mechanism moves bond prices away from their fundamental value when sentiment deteriorates. Corruption is found to be an aspect on which investors focus

during crises, implying that more corrupt emerging markets are more prone to bond sell-offs and comovement under extreme market conditions.

Abstract: I employ experimental methods to explore the way financial professionals adapt strategies of sovereign-bond investment during financial crises. I find that under pressure, investors shift from strategies consistent with expected utility maximization to ones in which they reduce information processing. Even when they have enough time to search all relevant information, when facing a financial crisis, investors focus on a selective subset of negative bond aspects, neglecting other relevant information. I suggest that this mechanism moves bond prices away from their fundamental value when sentiment deteriorates. Corruption is found to be an aspect on which investors focus during crises, implying that more corrupt emerging markets are more prone to bond sell-offs and comovement under extreme market conditions.

Peiran, Jiao

Investors' Reinforcement Learning

Jiao, Peiran

Research Question: Do investors overweight personal experience relative to beliefs about the future, resulting in suboptimality?

Main Result: Subjects overweight experience in that positive experience with an asset excessively increases the likelihood of subsequent purchases, although they are given full descriptive information of assets.

Abstract: Conventional portfolio theories require investors to form subjective beliefs about probability distributions of future states. However, this can be so demanding in the real world that investors may instead resort to heuristic rules. This study focuses on one particular deviation from the conventional theories, investigating whether and how boundedly rational investors overweight experience when making decisions under uncertainty. This project also relates to the psychology literature on the experience-description gap (See for example, Erev and Haruvy, 2013), testing whether given precise description of the incentive structure, decision makers still rely excessively on experience, resulting in suboptimal choices.

How experience, rewards or punishments, shapes subsequent behavior was extensively studied under the law of effect by (Thorndike, 1898), and later developed into reinforcement learning models in psychology and economics, with most applications in game theory explaining players' repeated choice of the actions that brought more rewarding experience in the past, even when the environment has changed (See e.g. Suppes and Atkinson, 1960; Erev and Roth, 1998; Camerer and Ho, 1999; Charness and Levine, 2005). The finance literature has documented that more experience induces better performance (Nicolosi, Peng and Zhu, 2009) and less disposition effect (Dhar and Zhu, 2006), and that more rewarding experience with IPO auctions (Kaustia and Knupfer, 2008), 401(k) portfolios (Choi et al., 2009) and common stocks (Strahilevitz, Odean and Barber, 2011) increases an investor's subsequent demand for them, which hurts their performance in general. However, little is known about the mechanism how investors learn from experience.

This project uses repeated investment tasks with feedback, where decisions based on descriptive and experiential information are both plausible, to test the weight participants place on each. The behavioral implications and predictive power of relevant models both with (Camerer and Ho, 1999; Nevo and Erev, 1999) and without (Kahneman and Tversky, 1979) learning will be evaluated. The reasons for choosing a lab experiment over other empirical methods are threefold: (1) an important element in the model, investors' beliefs, cannot be directly observed in the field; (2) when studying real-world prices, we lack a benchmark to conveniently disentangle the information value and reinforcement value in historical prices; (3) reinforcements and information can be directly manipulated in the lab for a strong test of the learning models.

The experiment has two stages. The first stage is the same across conditions. It elicits attitudes towards risk and loss using the multiple-price-list approach adapted from (Holt and Laury, 2002). In the second stage, participants observe 4 hypothetical assets, whose prices are generated independently each period in a similar fashion as (Weber and Camerer, 1998). Every period, the direction of price change is determined by 4 equally-likely underlying processes, with the probability of price increase each period being 65%, 55%, 45% and 35% respectively. Price cannot stay unchanged. Then the price change magnitude is randomly drawn from {1, 3, 5}. Participants first observe 6 periods of price history. Then for the 20 subsequent periods they can choose one share of an asset to purchase each period (the buy task), which is automatically sold when the next period price is revealed. Another task is to predict the probability of price increase for each asset in each period (the predict task). Rewards in the buy task are calculated according to actual prices. Belief elicitation are incentivized using the quadratic scoring rule, corrected for risk attitudes (Offerman et al., 2009).

There are three conditions (A, B, and C), each containing three rounds (1, 2, and 3). Conditions A1, B1 and C1 use the same price sequences; in B1, participants only have the predict task; in C1, they are endowed with experimental cash (EC) and only have the buy task; in A1 they do both tasks. A2 and B2 use a different set of price sequences, and different initial endowments: EC plus an asset portfolio (A2) or additional EC (B2). In A2 the

endowed assets are automatically sold after participants observe the 6-period price history, with any gain or loss added to their accounts. A3 and B3 use price sequences with the same ups and downs as A2 and B2, but different random draws of price change magnitudes from {1, 3, 5}. C2 and C3 respectively use the price sequences of A2 and A3, but participants have less information, in that they only know the four price-generating processes differ in the probability of price increase, but not the specific probabilities. The design is summarized in Table 1. The order of tasks will be randomized across participants and conditions. Three things are manipulated across conditions: initial endowment, size of price changes (reinforcements) and information.

The advantage of using price sequences predetermined in this manner is a clear benchmark for Bayesian beliefs and for the information value of historical prices. In this context, a Bayesian agent should count the number of ups, believe the sequence with more ups to be more likely to continue going up, and buy such shares in all periods, even in the low information condition. A quasi-Bayesian decision maker may additionally be influenced by the order of price changes (See e.g., Rabin, 2002), but still not by the magnitudes, or by personal experience. Choices that deviate from decision rules that merely rely on beliefs (Bayesian or quasi-Bayesian) can be easily detected. The behavioral implication of simple reinforcement learning is the reluctance to shift away from an asset that brought gains and the excessive desire to avoid those that brought losses, which can be tested within each condition, between those who experience and those who only observe the outcomes. Controlling for beliefs, experienced outcomes should have no explanatory power for choices, unless individuals overweight experience.

Based on the above arguments, the following hypotheses can be generated. Comparing A2 with B2, reinforcement learning predicts more choices by A2 participants of the assets that gained during the first 6 periods in their initial endowments. A comparison of Round 2 with Round 3 in each condition and across conditions can reveal between- and within-subject differences in the responses to price change magnitudes. The size of price changes should not affect a Bayesian agent at all but may affect subsequent choices made by reinforcement learners. A comparison of A1 vis-a-vis B1 and C1 can reveal whether and by how much reinforcements bias beliefs, and whether elicitation of beliefs influence buying decisions. A comparison between B2, B3 and C2, C3 will demonstrate the effect of information on learning. Nevo and Erev (2012) suggest that under incomplete information about the environment, decision makers may exhibit some distinct behavioral patterns. For example, positive and negative surprises may both trigger change. Some preliminary results from the experiment suggest behavioral patterns consistent with overweighting of personal experience, and infrequent choice of the Bayesian optimal strategy even under the full information condition.

The belief and choice data will be used to structurally estimate model parameters using the Maximum Likelihood method. Specifically, the candidate models for this situation include those without learning, such as the expected utility theory and prospect theory (Kahneman and Tversky, 1979), and those with learning, such as the Experience-Weighted Attraction (EWA) model (Camerer and Ho, 1999) and the I-SAW model (Nevo and Erev, 2012). The EWA model, which is intended for interactions in games, will be adapted to this individual decision context.

If investors do learn from and overweight experience, this readily accommodates many empirical findings, such as the asymmetric effect of experience on the disposition effect in the domains of gains and losses (Feng and Seasholes, 2005), style investing (Barberis and Shleifer, 2003), category learning (Peng and Xiong, 2006), and the cohort effect (Malmendier and Nagel, 2009). A better understanding of individual investors' decision process can improve predictions of their behavior and market dynamics, inform the design of more efficient investor education, help brokerage firms improve their clients' performances, and increase market efficiency.

Petersen, Gesa-Kristina

How private investors' stress influences investor behavior and financial markets

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

Research Question: Does stress increase or decrease the development of bubbles, i.e. the amount of gambling and speculation in experimental asset markets?

Main Result: In stressed experimental asset markets significantly smaller bubbles develop.

Abstract: Stress is one of the most pervasive psychological and physiological reactions in modern society and on financial markets. Typically financial downturns and financial turmoils are termed as stressed financial markets though technically not the markets but the market participants are stressed. For this reason we want to analyze how stress can affect investor behavior and how this might have an effect on overall markets. Even though stress is ubiquitous, up to now there is only weak evidence on this relationship. We conduct a laboratory experiment in which participants are put under stress with the help of the Trier Social Stress Test for groups (TSSTG) (von Dawans, et al., 2011) and then trade in an experimental asset market based on the design of Smith, Suchanek and Williams, 1988. We control the development of stress by measuring salivary cortisol levels. Our results show that stressed market participants change the development of the experimental asset market in the way that less speculation takes place. We discuss possible individual level processes driving this effect, i.e. higher levels of

selective attention and lower levels of strategic risk taking.

Ploner, Matteo

Would Slowing Finance Improve Financial Markets Efficiency? Some Experimental Evidence

Ferri, Giovanni; Ploner, Matteo; Rizzolli, Matteo

Research Question: Would Slowing Finance Improve Financial Markets Efficiency?

Main Result: to be done

Abstract:

Standard financial theory and extensive macro evidence suggests that financial bubbles cause misallocation and even systemic crises. Behavioral finance shows that the origin of financial bubbles can be traced to agents' emotional status and to their cognitive limitations.

This seems to justify the long held tenet that “putting sand in the wheels” of finance may be desirable, a view behind the European Union's decision to establish a Tobin tax on financial transactions. On the other hand there is some experimental evidence that such Tobin tax has little effect in producing the desired results (Hanke et al 2010, Kirchler et al. 2011 Huber et al 2012) and the question whether introducing such a transaction tax is the most effective way of preventing the formation of financial bubbles remains unsolved.

With the present study we instead focus on whether alternative trading rules can reduce the departure from rational choices of market participants. Our experimental design allows us to identify the differing transaction patterns of a group of traders induced to take “emotional” investment choices vs. that of an alternative group where traders are prompted to take “rational” investment choices. Emotional choice is induced by burdening the traders of the former group with distracting tasks, while in the latter group's rational choice is favoured by enforcing a waiting time before transactions can be finalised. Then we try to disentangle whether the differences between the two patterns are mainly due to pro-emotional distraction or to pro-rational waiting.

We observe trading behaviour in a classical double auction market (Smith, Suchanek, and Williams, 1988) . We borrow from the design choices of Kirchler et al (2012) and rely on a declining fundamental value specification; we allow participants to trade in sessions 2 minutes long for 10 consecutive periods and with 8 people in each market. We compare the behaviour of participants in two different conditions, SLOW and FAST. In the SLOW condition, the participant who “closes” a transaction, either by buying or selling an amount of virtual stocks , is given a few seconds to either confirm or cancel the trade. In the FAST condition, the trader has no opportunity to cancel the order. For the sake of comparison, in the FAST condition the trader is given a “concurrent” task before being able to return to the market. This way, we keep balanced the exposure to trading time in the two conditions. As a concurrent task, traders in the FAST condition are asked to correctly recall a number that is displayed on the screen for a few seconds.

The FAST condition is more demanding in terms of cognitive resources than the SLOW condition, as it adds to the load of trading the cognitive load of memorizing the number.

In light of previous evidence in the economic and psychological literature (System 1 vs. System 2, Kahneman 2011), a burden imposed on the cognitive-deliberative system is likely to trigger a stronger reliance on the emotional-instinctive system. We hypothesize that deviations from fundamental-value trading in experimental asset markets is largely due to the prevalence of emotional instinctive reasoning over deliberative reasoning. Accordingly, we expect to observe larger deviations from fundamental value in the fast condition than in the slow one.

Powell, Owen

Measuring mispricing in experimental asset markets

Powell, Owen; Shestakova, Natalia

Research Question: Which measures of mispricing satisfy numeraire independence?

Main Result: Arithmetic-mean based measures (e.g. RD and RAD) are sensitive to the choice of numeraire; a geometric average satisfies independence.

Abstract: Mispricing (the difference between prices and their underlying fundamental values) is an important characteristic of markets. The literature on the topic consists of many different measures. This state of affairs is unsatisfactory, since different measures may produce different results. Stöckl et al. (2010) partially address this problem by proposing (among other things) that measures of mispricing be independent of certain nominal variables: the number of dividend payments and the absolute level of fundamental values. Their conditions rule out all previous measures used in the literature and leads them to propose new measures in response. This

paper proposes that mispricing measures be independent of an additional variable: the unit of account. This condition rules out the measures proposed by Stöckl et al. (2010) and serves as the basis for a new measure of market mispricing, the Geometric Average Deviation (GAD). The unit of account condition is relevant to many market settings, and thus calls into question the findings of previous research based on other measures that fail to satisfy this condition. An application illustrates the potential impact of this new measure on previous experimental results.

Prystav, Fabian

Personal Information in Peer-to-Peer Loan Applications: Is Less More?

Fabian Prystav

Research Question: How does the availability of borrowers' personal information in peer-to-peer loan applications affect lenders' investment behavior?

Main Result: The amount allocated to loan projects versus a bank account decreases with ascending levels of information availability. However, investors ignore projects from the worst—but most common—rating category X, unless personal information is available to allow the mitigation of information asymmetries.

Abstract: Online peer-to-peer lending companies set the rules for transactions on their platforms and could decide to limit the general visibility of borrowers' personal information in loan requests, if this proved to profitably influence lenders' investment behavior. In my experiment, I asked participants to allocate an amount of € 1,000 between real peer-to-peer loan requests and a bank account. Participants were shown projects on one of four levels of information availability, ranging from only the most basic information set to the full profile including borrowers' pictures. Against the initial theory-based expectation, I find that the amount allocated to loan projects versus the bank decreases with ascending levels of information availability. A premature conclusion that "less is more" when it comes to personal information in peer-to-peer loans, has to be revised based on the finding that investors ignore projects from the worst—but most common—rating category X, unless personal information is available to allow the mitigation of information asymmetries. In addition, I find that investors are attracted by high monthly liquidity of borrowers, penalize loan applicants seeking funding for non-existential purposes and support those who state self-employment or personal education as loan purpose.

Riyanto, Yohanes E.

Liquidation Policy and Disclosure of Credit History in Financial Contracting: An Experiment

Jia Liu; Yohanes E. Riyanto

Research Question: What are the impacts of (1) liquidation policy on borrowers' incentive to engage in strategic default and (2) disclosure of credit history information on lending relationships and borrowers' behaviors?

Main Result: Liquidation policy deters borrowers from defaulting strategically, and the availability of credit information softens the liquidation policy and helps reduce strategic defaults.

Abstract: In the presence of contract incompleteness and asymmetric information, liquidation policy plays an important role in financial contracting. Liquidation is a double-edged sword. It deters borrowers from defaulting strategically, but it could be harsh to borrowers experiencing short-term liquidity problems. This paper presents an experimental analysis of the impacts of (1) liquidation policy on borrowers' incentive to engage in strategic default and (2) disclosure of credit history information on lending relationships and borrowers' behaviors. We show that liquidation policy deters borrowers from defaulting strategically, and the availability of credit information softens the liquidation policy and helps reduce strategic defaults.

Schindler, David

Overpricing and Stake Size: On the Robustness of Experimental Asset Markets

Kocher, Martin G.; Martinsson, Peter; Schindler, David

Research Question: Can overpricing in experimental markets be reduced when more money is at stake?

Main Result: Overpricing is not reduced as a result of higher stakes.

Abstract: External validity is a typical concern for economic experiments. In the case of financial markets it can be argued that incentives in laboratory experiments are not sufficient for subjects to refrain from speculative and often disadvantageous trading. To test whether the common finding of substantial overpricing in the experimental

finance literature carries over to settings in which incentives are stronger, we conduct an experiment in Vietnam. While our control group is endowed with a typical hourly rate for student subjects in Vietnam, our treatment group's endowment is five times higher. We observe substantial overpricing in both treatments, as prices are on average more than 20 % above fundamental value. The extent of overpricing however does not vary significantly across our specifications, suggesting that results from experimental asset markets are robust to increasing incentives. While average prices seem to be unaffected, we observe a significant increase in trading volume in our high stakes condition. At the same time, subjects report to be less risk-averse when stakes are high. We interpret this finding as evidence for subjects having the desire to increase profits from trading even more when stakes are high.

Design: 120 subjects took part in 6 experimental sessions at Ho Chi Minh City University of Economics, Vietnam in August 2014. Half of the subjects were randomly allocated to a low stakes condition and a high stakes condition, respectively. Subjects in the low stakes condition were endowed on average with 128,000 Vietnamese Dong worth in cash and assets, a standard rate for subjects at this laboratory, while subjects in the high stakes condition received an endowment of 640,000 Vietnamese Dong. They subsequently engaged in trading in groups of ten for ten periods. The underlying market structure is similar to Smith, Suchanek, Williams (1988) and Kirchler, Huber, Stöckl (2012). Particularly, we use a continuous double auction format with open order books. Each of the ten periods lasted 120 seconds and we induced incentives to trade by randomly varying the composition of the endowment by giving each subject more (less) shares and less (more) cash. During each trading period, traders could post bids and asks as well as accept open bids and asks. Inactive orders remained in the books until the beginning of the following period, and partially executed bids and asks continued to be listed with their residual quantities. At the end of every period, the asset paid a dividend or not with equal probability. The dividend was added to each trader's cash holdings. Assets had no remaining value after the last dividend payment, i.e. they displayed a declining (expected) fundamental value. This design feature was explicitly stated and highlighted in the instructions. To make things clear, the instructions provided a detailed table with the sum of remaining expected dividend payments per unit of the asset at any point in time. Assets and cash were carried from period to period. Short selling and borrowing experimental points were not allowed. To make sure our two conditions were as similar as possible, the only difference in instructions and experimental code was the exchange rate from experimental points to Vietnamese Dong. All instructions were read aloud in Vietnamese and remaining questions were answered in private. Subjects first completed a trial run of the asset market to become familiar with the program (which was written in z-Tree, Fischbacher, 2007). After the asset market concluded, subjects filled in a questionnaire asking for standard demographics.

Results: Since trading behavior within a market is correlated, we conduct our analysis at the most conservative level, i.e. the market level. Therefore, we collapse each variable to its market mean, leaving us with six independent observations per condition.

Both of our conditions exhibit strong tendencies of overpricing with some degree of heterogeneity: In our high stakes condition, prices are on average 21 % (standard deviation: 65 % points) above fundamental value, whereas they are 24 % (standard deviation: 47 % points) above fundamental value in our low stakes condition. This difference is not significant: $p > .87$ (Mann-Whitney U test). Refining our measure for overpricing does not change this insignificance; particularly we look at average and median market prices (quantity-adjusted and trade-adjusted), the degree of mispricing RAD (Stöckl et al. 2010) and price of first trade only: all $p > .4$ (Mann-Whitney U tests).

We however find that subjects tend to increase their trading activities when more is at stake. While the average number of assets traded in our low stakes condition is 12 shares per period, it increases to almost 16 shares per period in the high stakes condition. This difference is significant according to a Mann-Whitney U test: $p = .0547$. Hence, when more is at stake, subjects try to increase their trading profits (or reduce their trading losses) by taking more risk and trading at higher frequencies rather than purely relying on the dividend payment. This is confirmed by a post-experimental subjective assessment of risk attitudes: subjects in the high stakes condition report to be more risk-seeking than those in the low stakes condition (Mann-Whitney U test: $p = .0683$).

Conclusion: Our results confirm the existence of overpricing often found in the experimental finance literature, even for high stakes. While we find strong heterogeneity in overpricing and overpricing of similar magnitude as in other experiments in Europe and the US, we also find higher trading frequencies when stakes are larger. The substantially more frequent trading however does not translate into differences in prices.

Schmelzer, André

The Impact of Distracted Attention and Perceived Reputation on Investor Confidence and Portfolio Choice under Uncertainty

Schmelzer, André; Hillenbrand, Adrian

Research Question: What is the impact of distracted attention and perceived reputation on beliefs and investment choices?

Main Result: Impact of distracted attention on beliefs and choices.

Abstract: One regulatory response to the financial crisis 2007-08 was to improve individual financial decision making by simplifying information disclosures of financial products (e.g. EU directive UCITS IV). More precisely, key investor information documents (KIIDs) were introduced as mandatory requirement for investment funds. These documents aim at increasing understandability and comparability of financial products for retail investors. However, present regulation does not regulate the format of the information. Experimental results show that visual format variations can have an impact on individual decisions. We exploit this fact and regard real world documents as a case study. We investigate the impact of distracted attention and perceived reputation on investor confidence and choice behavior in a laboratory experiment.

Recent literature finds that individuals focus on graphical as well as past performance information when reading information disclosures (Kozup et al., 2008; Beshears et al., 2011; Sirri and Tufano, 1998; Goeij et al. 2014; Choi et al., 2010). Field evidence indicates that manipulating the information format has an impact on choice behavior (Bertrand and Morse, 2011; Choi et al., 2014; Bertrand et al. 2010; Barber and Odean, 2008; Hirshleifer et al., 2009). The results suggest that seemingly small changes in the information document can have an impact on investor behavior. The literature focuses on changing information shown. We go further by investigating whether a manipulation of the information architecture (i.e. the format) - without changing the quantity or quality of information - suffices to change choice behavior. We propose a theoretical mechanism which relates attention and perceived reputation to beliefs and choice. Visual cues – as to be found in real world KIIDs – are suggested to impact investor beliefs through distracting attention and enhancing perceived reputation.

We investigate distracted attention and perceived reputation as possible determinants of the well known overconfidence bias (e.g. Griffin and Tversky, 1992; Odean, 1999; Merkle and Weber, 2011). We distinguish two expressions of overconfidence: overestimation and overprecision of future returns (Moore and Healy, 2008). Empirically, overconfidence bias is found to lead to overinvestment in the financial product (Barber and Odean, 2011). From psychology literature we know that there is an attention distraction effect by competing visual cues (Kruschke and Johansen, 1999; economics: Hirshleifer et al., 2009). Visual cues may also trigger emotional reactions to impact beliefs (Frijda et al., 2000). We call this effect perceived reputation since it cannot be captured by Bayesian models of rational reputation.

We set up a formal model of Bayesian updating and information search under ambiguity where both factors are impacting overconfidence bias and portfolio choice (Alti and Tetlock, 2014; Peress, 2010; Ko and Huang, 2007). The model takes account of attention distraction as well as cognitive limitations considered as information search costs. Individuals choose an optimal share of investment into the risky asset conditional on their posterior belief distribution. Overconfidence is modeled in the updating process of the posterior. Our model predicts both, changes in posterior beliefs about the mean and variance and changes in investment in the risky fund.

We employ a between-subjects experimental design. The controlled laboratory experiment allows us to make sure that participants focus solely on the KIID information provided and to elicit belief data additionally to choice data. We assign participants randomly to either treatment or control group. In the control group, individuals receive real world KIIDs from mutual funds containing visual stimuli. In the treatment group, individuals receive standardized KIIDs from the same funds. Note that there is no information asymmetry between both information documents. We standardize the real world KIIDs by removing attention-grabbing visual cues from the layout.

We disentangle the effects of perceived reputation from distracted attention by varying familiarity of the real world funds within each treatment. Random order of the funds is held constant across treatments. In comparing beliefs and choices for familiar funds we assess the main effect of both factors. However, in comparing unfamiliar funds in both treatments we measure the effect of distracted attention since perceived reputation cannot be enhanced for prior unfamiliar funds.

Our participants face a belief elicitation task and a standard portfolio choice task repeated for four different funds with a four week investment horizon (e.g. Choi et al., 2010). Besides choice data, we elicit the entire posterior belief distribution. We elicit subjective belief distributions incentivized by an incentive compatible randomized version of the quadratic scoring rule (Hossain and Okui, 2013; Harrison et al. 2014). Either beliefs or choices are paid in order to avoid hedging effects between tasks (Blanco et al. 2010). Participants are paid according to the actual future development of returns and costs of the corresponding fund.

Early results from a similar dataset suggest that there is a treatment difference. Our contribution is twofold. We shed light on two externally manipulable determinants of investor confidence which cannot be captured by standard Bayesian updating: distracted attention and perceived reputation. Our work also contributes to the policy debate on evidence based disclosure regulations by providing experimental data on responses to financial products (Campbell et al., 2011).

Schwieren, Christiane

Chronic Stress and Risky Decisions

Ceccato, Smarandita, Schwieren, Christiane; Kudielka, Brigitte

Research Question: Do chronically stressed people differ from non-stressed in their propensity to take risks?

Main Result: Chronically stressed people are more prone to take risks.

Abstract: Stress is a domain of research that has increased in popularity in recent years. The reason for this heightened interest is the fact that stressors have multiplied proportionally with the amount of political and economic uncertainty in the contemporary world, and more and more individuals of all ages are affected by it (Anderson et al., 2011). Stress as a physiological phenomenon is double-sided: it has initially evolved as a useful, acute response to threat or challenge that marshals metabolic resources to adapt to short-term survival needs. However, when prolonged or having multiple sources, stress fosters chronicity, which leads to disease and degradation of bodily systems, including those involved in cognition and decision making (e.g. Lupien and Lepage, 2001; McEwen, 2004). Despite its importance, the knowledge of how exactly chronic stress affects cognitive mechanisms, decisions, and thus behavior, is very limited at the moment. It is however important, if chronic stress significantly alters cognition and decision-making processes, to uncover to which extent and in what manner this happens, because in general it should be exactly in times of chronic stress that decisions should be optimal and functional, to be able to exit the chronically stressful condition.

Even though most experimental work in the stress and decision-making field concentrated on acute stress and results are heterogeneous in terms of direction, the current conclusion is that decision-making under acute stress is altered (Starcke and Brand, 2012; Buckert et al., 2014). This finding is not only relevant for potentially stressed stock traders, but also for other vulnerable groups as, for instance, public employees dealing with emergency situations - like firemen, doctors, or policemen (Trautmann, 2014). Moreover, under the premises of increasing stress in the contemporary society and the uncertain character of most decisions individuals face daily, the fact that stress affects decisions under uncertainty becomes relevant for all individuals, especially since it has been shown that cortisol levels as biomarkers for stress increase with increasing contextual uncertainty (Coates and Herbert, 2008) With increasing levels of stress, prolonged exposure to stress and the multiplication of stressors, not only acute stress, but also stress chronicity might impact decisions in uncertain situations. We thus propose one of the first investigations of decision-making under chronic stress and chronic cortisol exposure and aim to assess if the reported effects of momentary stress on risky decision behavior maintain under chronic stress.

We measured financial risk-taking behavior in the gain domain in a pen-and-paper incentivized task. The risk-taking task followed, for comparability, a standard paradigm and consisted of 25 binary choices between a safe lottery offering 2.25 € and a risky lottery, a supplement of 5 binary choices between the same safe option and an ambiguous lottery, as well as 3 control trials proposing choices between the safe lottery and another safe lottery offering a higher amount. The task follows the design used in Buckert et al. (2014) and Hayden et al. (2010). To measure chronic stress, we use the Trier Inventory for the Assessment of Chronic Stress (TICS) and additionally collected hair samples from volunteers, in order to quantify chronic cortisol exposure. We discovered a significant, positive correlation between self-reported chronic stress and risk-taking that is stronger for women than for men. This confirms part of the findings in acute stress research: there is a connection between high stress and increased risk taking. However, unlike the biologically-based results from acute stress research, we did not identify a significant relation between hair cortisol and behavior. In line with previous literature, we found a clear gender difference in risk-taking and self-reports: women generally take less risk and report slightly higher stress levels than men. We conclude that (perceived) chronic stress might impact risk taking behavior for men and women. If these laboratory results can be generalized to real-world decision making, this might have important implications for financial decision making. In times of financial strain, for example, one might not necessarily want to be more risk seeking in financial decisions. However, this is just a first study, and further research is necessary in order to unveil the mechanism accounting for these behavioral effects and to understand whether our laboratory findings have direct implications for real world decision making.

Shestakova, Natalia

Bubbles, Experience, and Success

Gladysrev, Dmitry; Powell, Owen; Shestakova, Natalia

Research Question: Is efficiency of mixed-experience markets sensitive to the previous success of experienced traders?

Main Result: Price efficiency of mixed-experience markets is sensitive to the previous success of experienced traders. Specifically, price efficiency is the lowest with least successful experienced traders and the highest with moderately successful experienced traders, being somewhere in between with most successful ones.

Abstract: One of the most robust findings in experimental asset market literature is the experience effect—asset markets populated by traders who are familiar with the market environment demonstrate a very high level of price efficiency. A few studies suggest that the effect still holds even in mixed-experience markets, i.e. when some of the experienced traders are replaced with inexperienced. Results of our asset market experiment, standard in most aspects, suggest that, first, the experience effect is not as robust as was previously thought and, second, price efficiency of mixed-experience markets is sensitive to the previous success of experienced traders. Specifically, mixed-experience markets with experienced traders being least and most successful in the past are characterized by a lower price efficiency than those with experienced traders being moderately successful.

Sonnemans, Joep

Learning and Evolution in a Multi-Round Strategy-Method Minority-Game Experiment

Linde, Jona; Sonnemans, Joep; Tuinstra, Jan

Research Question: How can we explain the surprising result that coordination, and therefore efficiency, does not increase over the rounds, while an evolutionary simulation with the submitted strategies yields a rapid increase in coordination in the Multi-Round Strategy-Met

Main Result: It is not a lack of information that limited learning, but an underestimation of noise by the participants.

Abstract: Scholar.google gives about 2500 hits on the term “minority game” and although most papers are in physics or computer science, we get still about 1100 hits when the search terms “financial” and “markets” are added. In econophysics the minority game is a canonical heterogeneous agents model of speculation in financial markets. We can explain the game in the words of Challet et al. (2005, page 4):

“The rules are the following: the players take bets that the price for next trading period will go up or down, and position themselves according to their convictions. The total sum of the aggregate positions of all the players determine the outcome of the next price movement, which in turn results in losses or gains depending on the respective positions taken. If most of the people buy, the price will go up, therefore it is convenient to be a seller. If the majority is on the selling side, those who buy will be on the winning side. In both cases, it pays to be in the minority, hence the name Minority Game.”

Minority games are a stylized description of strategic situations with both coordination and competition. In a recent paper (Linde, Sonnemans & Tuinstra, *Games and Economic Behavior*, 2014) we report on a multi-round strategy-method experiment on the five-person minority game (visit www.creedexperiment.nl/minor/english/ to play the game). We found that coordination, and therefore efficiency, does not increase over the rounds, while an evolutionary simulation with the submitted strategies yields a rapid increase in coordination. This is surprising as participants could assess the performance of potential new strategies by running simulations against the population of strategies in previous rounds. Running simulations would allow them to discard strategies that perform badly in the old population, similar to the evolutionary selection process.

In this paper we report two new treatments in which we explore whether the lack of increasing coordination in the experiment is due to either 1) a lack of information on how to develop better strategies, or 2) noise in the information about the performance of potential new strategies against the old population.

To examine the first point we run a treatment where participants get full information about the formulation and performance of all strategies in the previous round, allowing them to learn from well performing strategies. They can copy (parts of) successful strategies from the past round, and they can run simulations with a strategy of their own making against specific strategies from previous rounds. If participants decide to copy successful strategies, that would be similar to the evolutionary selection process. At the other hand, participants may anticipate that others will copy successful strategies and search for a strategy that can exploit this. Surprisingly, we find that participants do much worse than in the original experiment, especially in the second and third round. This is mainly caused by imitation. In the first round the winning strategy changed only after winning, which successfully exploited the common strategies that mostly change after losing. This win-change strategy performs very badly

against copies and the imitators performed very badly. In the second round the winning strategy changed only after losing, with a probability of 50%. This again was imitated, and the imitators earned only few points and the winner was a moderated version of the first round winner (change with probability of 50% after winning). To put it in a nutshell, the analysis has shown that public information about the performances of all strategies in the previous round can cause bad aggregate performances in minority games, because they lead participants to choose strategies that are too similar to each other and that can easily be exploited.

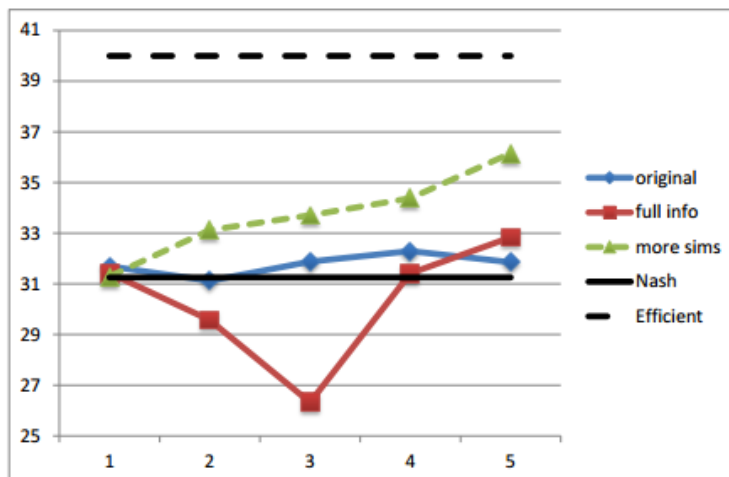


Figure 1: On the horizontal axis the round, on the vertical axis the average number of points. The average number of points stays close to the average number in the Nash solution (31.25) in the original experiment. In the full-info treatment the earnings are particularly low in the second and third round. In the treatment with more simulations the average earnings increase over rounds.

The second point is addressed by forcing participants to run ten, rather than one, simulations at a time, thereby reducing the noise in the feedback they receive about the performance of their new strategy against the old population. We find that the treatment with ten simulations at a time does lead to increased efficiency. We conclude that the limited learning in the original experiment is caused by an underestimation of noise by the participants.

Sprenger, Julia

Take it or leave it? Financial Literacy, Confidence, and Information Strategy

Sprenger, Julia

Research Question: How do financial literacy/ confidence influence information acquisition behavior prior to financial decision-making?

Main Result: Confidence explains which information strategy is favored / high financial literacy leads to a critical conduct towards advice ex ante but not ex post

Abstract: The current study examines individual decision making in the field of personal finance. How do people arrive at a financial decision? Two laboratory experiments investigate the link between financial literacy, confidence and the way external information are integrated into the decision-making process.

The first experiment investigates whether the level of confidence influences the information strategy adopted. The term confidence is used to describe the relationship between objective knowledge and subjective knowledge. Previous research has shown that subjective and objective measures of financial knowledge do not necessarily coincide (e.g. Courchane, 2005, Robb & Woodyard, 2011). Non-coincidence can point in two directions: If the subjective knowledge exceeds the objective knowledge, subjects are overconfident, i.e. they think they know more than they actually do (Alba & Hutchinson 2000). In the opposite case subjects are underconfident. To prepare a financial decision subjects have two information strategies at choice: relying on prior knowledge and information obtained from memory (internal search for information) or seeking new information from the environment (external search for information). Prior research showed that subjects decide to collect external information when the internal search proves inadequate (e.g. Assael, 1984; Bettman, 1979; Engel et al., 2000). If assessing the own knowledge base accurately is chronically error-prone, is the individual level of confidence a main influence factor on the decision to access external information?

The second experiment investigates the impact of financial literacy on the conduct towards advice ex ante and ex post: Does a high level of financial literacy prevent advice seeking? Does a high level of financial literacy lower

compliance and promote advice discounting? The main purpose of the second experiment is to offer an integrated view of both perspectives that allows for a) examining the temporal range of influence of financial literacy on advice utilization and b) examining the influence of financial literacy relative to contextual traits.

Experimental Design

Both experiments consist 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 set 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 several products. Furthermore, they can prepare their choice by using additional information: In the first experiment, participants can acquire explanations of specific terms (e.g. APR). In the second experiment, participants can acquire explanations as well as a recommendation for a certain product (advice). In both experiments these additional information are displayed on demand only and their use is charged.

The experiments were programmed and conducted with the software z-Tree (Fischbacher, 2007).

Results: In both experiments non-coincidence of subjective and objective measure of financial literacy was predominant.

In the first experiment 145 decision situations were analysed. Results indicate that underconfidence leads to preferring an information strategy that includes external information whereas overconfidence increases the likelihood that subjects solely rely on their internal sources of information. This holds true across different levels of financial literacy and results in a significantly thinner information base for overconfident participants.

Results from the second experiment reveal an interesting relationship between financial literacy and reliance upon advice:

Ex ante, financial literacy promotes a critical conduct towards advice. Financial literacy lowers the demand for and postpones the use of advice. If advice is sought at all, this is only after a long period of hesitation. Overconfidence has a similar but less pronounced effect. Conversely, low financial literacy increases the reliance upon advice, indicating that advice serves as a substitute for, rather than a complement to, advice.

Ex post, this effect disappears: Participants with high financial literacy are by no means less likely to follow advice than subjects with low financial literacy, even when the quality of advice is moderate. The same holds true for high levels of confidence.

Discussion and Conclusion

For many financial decisions people have the option to seek external information before making their choice. However, their level of financial literacy alone might not be a good indicator of the likelihood that they will actually do so. As individuals have problems to assess their financial knowledge accurately taking into account the individual level of confidence on information strategy leads to refined predictions.

By comparing an ex ante and an ex post perspective on advice utilization the current study shows that the negative influence of financial literacy is limited to the ex ante situation. Furthermore, the current study reveals a hierarchy between influence factors on advice discounting that so far have been analysed separately: On the one hand, advice was given on demand only and acquiring advice was costly. Both contextual traits are assumed to promote compliance (e.g. Gibbons et al., 2003; Gino, 2005). On the other hand, high financial literacy is assumed to reduce compliance (e.g. Sniezek et al. 2004, Bucher-Koenen & Koenen, 2011). In the experiment, compliance was prevalent, indicating that the influence of the contextual traits was dominant. Financial literacy might promote a critical conduct towards advice ex ante but it does not immunize against sunk cost fallacies.

Sproten, Alec N.

Fostering the Best Execution Regime - an Experiment about Pecuniary Sanctions and Accountability in Fiduciary Money Management

Casal, Sandro; Ploner, Matteo; Sproten, Alec

Research Question: Which mechanisms force fund managers to behave in line with the preferences of investors when there is a conflict of interest?

Main Result: In the existence of a conflict of interest, a combination of accountability and threat of punishment works best to align fund managers' behaviour with the preferences of investors.

Abstract: Asset management often involves a conflict of interests between investors and fund managers. A main goal of financial regulators is to identify and mitigate this conflict. This article focuses on measures that may foster protection of investors' interests. In an experiment capturing the essential elements of asset management, we find that managers' accountability does not prevent their opportunistic behavior if not backed by a threat of punishment. Further, investors inefficiently sanction managers if not completely aware of managers' choices. To

effectively protect investors in financial intermediations, financial regulators should ensure both managers' accountability and a credible sanctioning system.

Stefan, Trautmann

Risk, Time pressure, & Selection effects

Martin Kocher, David Schindler, Stefan Trautmann, & Yilong Xu

Research Question: Are selection effects for decision makers who select into adverse decision environments?

Main Result: Yes, individual differences are important for how people deal with adverse decision environments, e.g. time pressure in financial markets.

Abstract: Empirical studies of decision making typically provide the decision maker with ample time to make her decision, possibly allow for revision or correction of her choices, and sometimes provide learning opportunities in the form of repeated trials. The decision maker should find herself in an optimal setting to make good decisions. However, many decisions outside the researcher's lab are actually made under very unfavorable conditions. Students of the descriptive aspects of decision making have therefore become interested in observing people's decisions in controlled experimental settings that try to mimic aspects of unfavorable decision environments. One obvious aspect of professionals' decisions that has been transferred to controlled laboratory settings is the presence of time pressure in decision making. Randomly allocating people into time-constrained and unconstrained decision environments, researchers have identified the causal effects of time pressure on various types of decisions.

Observing decisions in adverse, but controlled environments is important. It provides insights into decision processes. It also aims to improve the external validity of descriptive accounts of decision making. However, there are at least two problems with the approach. First, and specifically for the case of time-constraints, if time pressure is supposed to be substantial, some people may violate the time constraint. The sample of decisions observed in the data set is therefore self-selected. The second problem applies more broadly to any aspect of adverse environments implemented in randomized experiments. Because outside the lab people self-select into occupations and thus into job-related decision making environments, external validity may not be given despite similarity of the experimental and the natural decision environments. While external validity is an issue in any empirical study, it is a more central aspect in experiments that explicitly aim to mimic natural decision environments.

Observing that selection issues are at the heart of experiments with time pressure and other adverse conditions, we aim to study the empirical relevance of selection effects and their individual-level correlates in background variables. To this end, we collect data on risky decisions under time pressure, augmenting a design used in Kocher et al. (2013). First, we measure participants' scores on a measure of cognitive ability, and on a score of cognitive efficiency, to test whether these individual differences predict decision quality (measured in terms expected payoffs, discussed in detail below) under time pressure and in the absence of time pressure. Second, we implement a design that allows for both between-subject and within person analyses of behavior across time-constraint conditions. Thus, we observe each decision maker's behavior both in the presence and the absence of time pressure for a similar set of risky choices. We describe the experimental design including our measures of ability and efficiency in the next section.

Van Boening, Mark V.

Trading Outcomes and Price Dynamics in Some Experimental Asset Markets

Mark Van Boening

Research Question: Are excess bids a reliable predictor of price dynamics in SSW markets?

Main Result: An augmented version of SSW excess bids appears to be a robust predictor.

Abstract: Following the seminal Smith, Suchanek and Williams (SSW, 1988) an extended line of research has investigated bubbles and crashes in experimental markets for long-lived assets. Two significant examples are Hussam, Porter and Smith "Thar She Blows" (2008) and the Kirchler, Huber and Stockl "Thar She Bursts" (2012). Numerous researchers have made, and still continue to make, important contributions advancing our understanding of asset price formation. However, much of the post-SSW work omits analysis parallel to the "lagged excess bids" regressions that are an integral part of SSW. Those regressions model endogenous period-to-period price adjustments as a function of excess demand, with lagged excess bids serving as a proxy. SSW use this empirical regularity to distinguish between rationality in the sense of Muth (expectations sustained by outcomes that in turn support some theory) and rationality in the sense of Nash (expectations sustained by

outcomes). They find that lagged excess bids are a reasonably reliable predictor of mean price changes in 'bubble and crash' markets. They infer that this is consistent with rationality in the sense of Nash, but inconsistent with rationality in the sense of Muth.

Much of the subsequent work analyzes behavior through the lens of Muthian rationality, e.g., trying to identify under what circumstances can researchers consistently observe endogenous price patterns that are consistent with those predicted by (risk-adjusted) changes in fundamental value. This has included institutional rules (e.g., double versus sealed bid/ask auctions), ancillary markets (e.g., futures markets), presentations or explanations of information (e.g., subject instructions), etc. Other work has looked at classifying subjects by "trader type" (e.g., momentum, value, or rationally speculating traders), psychological phenomena, gender differences, etc. While the body of work has provided considerable insight, the underlying approach has focused on Muth-type rationality instead of Nash-type rationality.

Understanding Nash-type rationality in experimental asset markets is potentially important because it can help us understand how Muth-type irrationality can occur even in a setting where all relevant preconditions for Muth-type rationality have (apparently) been met. For example, Kirchler et al. (2012) provide information on dividend distributions, expected value, market history, etc. and the subjects have taken undergraduate finance courses, but bubbles still sometimes occur. Understanding Nash-type rationality can also help us understand how such behavior might evolve into Muth-type behavior, as with twice-experienced subjects or the Kirchler et al. "depletable gold mine" framing. This can in turn potentially help us identify (part of) the endogenous price formation process.

This paper analyzes the excess-bids phenomenon in double auction and sealed bid/ask auction markets. The initial analysis utilizes data from SSW (1988), Hussann et al. (2008), Kirchler et al. (2012), and Van Boening et al. (1990). There are two preliminary findings thus far, at least for markets with declining fundamental value. The first is that a lagged excess bids phenomenon is often observed regardless whether prices do or do not "bubble", although it is observed most often in markets where prices deviate from fundamental value. This suggests Nash-type behavior can persist even when Muth-type analysis implies that endogenous expectation formation is not present, i.e., some price adjustment mechanism may be at work even when prices track fundamental value.

A second, and related finding is that as an empirical measure, the simple SSW version of lagged excess bids may not be a robust proxy. In SSW, excess bids are simply the numerical difference between the number of bids and number of asks. However, the Kirchler et al. data (where bids and asks can be for multiple units) indicate that excess bids effect can sometimes appear as the difference between the number of units bid and asked, the difference between the bid and ask value of those units, or just the difference between the number of bids and asks (e.g., a bid for three units is counted as one bid). Additionally, in sealed bid/ask markets finds that the simple count version of excess bids has no explanatory power in price adjustment regression even when prices deviate substantially from fundamental value. This might suggest that the excess-bids phenomenon is unique to markets like the double auction where intra-period price dynamics are present. But a value-weighted measure does have explanatory power in the sealed bid/ask auctions. A similar measure, recomputed for sister double auction markets, has similar explanatory power as SSW's excess bids.

In addition to identifying a measure of endogenous price formation that is robust across experimental designs and across market institutions, a second objective is to analyze individual trader activity as the origin of the excess bids effect. The sealed bid/ask markets provide a good venue for this analysis, as the traders make one bid/ask quote per period (the quote can include both bids and asks, with the restriction that bid prices exceed asking prices, i.e., a trader cannot trade with one's self). The single quotes provide "snapshots" of subjects' activity that is not available in double auctions. Haruvy, Lahav and Noussair (2007) include the pessimism based on price-forecast belief statements. A similar analysis is conducted using individual success or failure at executing trades. The contribution is that price dynamics can be studied in terms of outcomes, augmenting the work based on expectations.

Vyrastekova, Jana

Trust and risk revisited

Kim Fairley, Alan Sanfey, Jana Vyrastekova and Utz Weitzel

Research Question: n.a.

Main Result: n.a.

Abstract: A trustor faces a risky choice in the trust game when he acts upon his belief regarding the chances of betrayal by the trustee. Despite intensive research there is no clear evidence for a link between lottery risk preferences and risk involved in trusting others. We argue that this is due to crucial differences between the risk measurements in the two settings. Trusting is giving up control to a human while lottery risk arises from a mechanistic randomization device. We propose a risky trust game that experimentally measures risk in the same context as the standard trust game, but nevertheless reduces the trust decision to objective risk. Our results

show that transfers in the trust game can indeed be explained by individual risk attitudes elicited with the risky trust game, while lottery risk preferences have no explanatory power

Wada, Ryoko

Portfolio Choice Based on Aspiration

Ryoko Wada

Research Question: What is the criteria for people accommodate the different risk lotteries ?

Main Result: People decide their portfolio selection based on their aspiration level.

Abstract: Bernatzi and Thaler (2001) show that the $1/n$ heuristic is frequently used in portfolio choice.

I investigate whether people use this heuristic in experiments with salient rewards where portfolios are formed by combining two securities.

My results show that subjects' choices are non-consistent even though across equivalent choice sets, and some of choices tend to be in line with the $1/n$ heuristic, but not as prominently as in Bernatzi and Thaler (2001) Subjects in this experiment are concerning to the results of their investments.

As for the settings, I gave my subjects perfectly equivalent choice sets in different stakes: the three equivalent low stake choice sets, the two middle stake equivalent choice sets, the three high stake equivalent choice sets.

All choice problems are made up of five securities including one safe asset. And the expected return of all securities is 1.1. The payoffs of risky assets are given depending on two states, State 1 and State 2.

State 1 occurs with one third probability, and State 2 occurs with two thirds probability.

Some choice problems are comprised of one risky asset(A,B or C) and safe asset(S). Some choice problems are comprised of one risky safe asset (A,B,or C) and the other risky asset D that have negative covariance. Security A has the lowest variation (0.08) and could give at most 3000 yen in State 1. Security B has the second largest variation (0.32), and would bring the second largest payoff of 3800 yen at most. Security C has the largest variation (0.72), would bring a maximum payoff of 4600 yen at most Security D is prepared to make negative covariance with security A,B and C. While every other security's more favorable state is State 1, security D's favorable state is State 2. Security D yields 2600 yen in State 2 and the subject will get 1400 yen in State 1 when they invest 2000 yen into it.

With some constraint of investment volumes to the assets, I gave my subjects superficially different but substantially equivalent choice sets. This is basic settings of this experiment.

Throughout the experiment, subjects are told that they are given 2000 yen (or 20 dollars at the exchange rate at 100 yen to a dollar) to invest into two securities in each choice problem.

Subjects are asked "What amount do you invest in security A and security B to sum up 2000 yen?"

Note that all expected value of all portfolio subjects could make is 1.1, therefore, their selections directly reflect their preferences over variations, that is, risk attitude.

In the last procedure of both experiments, the rewards for all subjects are decided in front of them. The experimenter decided which one choice problems are selected to pay rewards by rolling a public dice with ten faces. After that, one of the two states has come true by the other public dice.

If subjects were perfectly consistent, and if the best portfolio for him was in the lowest stake problems, he could select the same portfolio from the Set1 to the Set9. No one is perfectly consistent.

First I investigate the investment volumes of subjects. If they are naive, the distribution of investment amounts for securities should be concentrated in around of the point (1000,1000) for any choice problems. The volumes that selected most frequently was the (1000,1000) that suggests the naive diversification, and the second most frequent volumes that selected was (0,2000) yen into the first securities, and the third most frequently selected volumes was (2000,0). The result suggests that peoples choice were in line of the "naiveness" that Bernarzi and Thalar mentioned to same extent.

However, when I answers are compared between low stake choice problems and high stake choice problems, the shape of distributions are quite different. Especially, it is quite clear that most subjects invest less to the risky asset when they confronted the high stake choice problems.

Next, I tested whether I can see the answers for equivalent sets are significantly different via Wilcoxon test. Surprisingly, more risky portfolios are selected when the choice set contains a safe asset when the stakes of choice sets are small. People are inconsistent even though they are given perfectly equivalent choice sets. In addition, the more robust observation is that the enlargement of choice set made people less risk averse. People's preferences over risk are not absolute and they accommodate the various risk levels in their portfolio selection.

From above observations, I am interested what elements people have in their mind when they accommodate the

variations of their selection of lotteries. I investigated their portfolio choices via regressions using panel data. The expected payoffs in both states are adopted as non-explanatory variable. I selected the four elements as explanatory variables ; aspiration, maximum of the sets, standard deviations of portfolio, and safe asset dummy.

Both the random effect model and fixed effect model are investigated.

I and found that in both models the selected portfolios are strongly dependent on their "aspiration levels" that are defined as the minimum desired thresholds for each person. This result is very robust.

I found that the choices also affected by the maximum expected payoffs of each choice set when random effect model is adopted. In the fixed model , the maximum do not explain the selected expected payoffs. The standard deviations from the perfectly safe portfolio made people risk averse.

However, the reason why the safe asset framing does matter is left unsolved.

Weber, Martin

The Perception of Dependence and Investment Decisions

Michael Ungeheuer and Martin Weber

Research Question: n.a.

Main Result: n.a.

Abstract: We study the perception of dependence between asset returns and its impact on investment decisions. Our findings suggest that, while the structure of dependence influences investment decisions, correlation does not properly capture investors' perception of dependence. In a laboratory experiment we vary the structure of dependence between two assets, holding marginal distributions constant and presenting information realistically. When returns are moderate most subjects understand dependence and consistently incorporate it in their portfolio decisions. However, in the infrequent cases when returns are extreme, only few subjects correctly understand dependence. This finding suggests that investors could improve portfolio selection by taking into account biased beliefs about dependence.

Wolk, Leonard

Eliciting interval beliefs: An experimental study

Peeters, Ronald; Wolk, Leonard

Research Question: Can we use the interval scoring rule as a non-market based forecasting mechanism?

Main Result: We find that individuals forecast better when facing a low volatility process, but when individual forecasts are aggregated over groups, groups make better predictions when facing a high volatility process.

Abstract: In this paper we study the use of the interval scoring rule as a non-market based forecasting mechanism. In our experiment subjects forecast the termination time of a time series to be generated from a given but unknown stochastic process, where over time they gradually learn more about the underlying process and hence the true distribution over termination times. We conduct two treatments, one with a high and one with a low volatility process. We find that individuals forecast better when facing a low volatility process, but when individual forecasts are aggregated over groups, groups make better predictions when facing a high volatility process.

Zeisberger, Stefan B.

All's Well That Ends Well? On the Importance of How Returns are Achieved

Grosshans, Daniel; Zeisberger, Stefan

Research Question: Does the way a return is achieved influence investors' satisfaction and trading behavior?

Main Result: We find strong evidence that not only the final return, but to a large extent also the way a return was achieved affects investor's satisfaction and investment behavior. Investors are most happy if their investment first fall in value and then recover. They are least happy for the opposite pattern. Importantly, this shapes their investment behavior.

Abstract: We demonstrate that investor satisfaction with an investment is heavily influenced by the price path with which the final return is achieved. We analyze various different paths in the gain and loss domain in a series of experiments. For both domains, investors are happiest if their assets first fall in value and then recover, they

are least happy with the opposite pattern. Importantly, investors' emotional states systematically influence their valuation, beliefs, and trading behavior. Our results have far-reaching consequences as they allow a much more complete perspective on a wide range of areas in finance, such as the disposition effect, risk-taking behavior after previous gains and losses, and behavioral asset pricing.

List of Participants

Last name	First name	Affiliation	Primary email
Bag	Dinabandhu	NIT ROURKELA	dinabandhu.bag@gmail.com
Bahl	Martina	kapitalmarktteam.de	martina.bahl@kapitalmarktteam.de
Bao	Te	University of Groningen	t.bao@rug.nl
Betz	Dirk	GESIS Leibniz-Institut für Sozialwissenschaften	dirk.betz@gesis.org
Biais	Bruno	Toulouse School of Economics	bruno.biais@ut-capitole.fr
Binossek	Claudia	GESIS Leibniz-Institut für Sozialwissenschaften	claudia.binossek@gesis.org
Bloemkolk	Remco	Radboud University	remco.bloemkolk@gmail.com
Bosch-Rosa	Ciril	Berlin Technical University	cirilbosch@gmail.com
Bourke	Vincent	Chapman University, Orange, CA, USA	bourk102@mail.chapman.edu
Breaban	Adriana	Tilburg University, Tilburg, Netherlands	a.breaban@uvt.nl
Carle	Tim	University of Luxembourg	tim.carle@uni.lu
Choo	Lawrence	University of Erlangen-Nuremberg	lawrence.cy.choo@fau.de
Colasante	Annarita	Università Politecnica delle Marche	a.colasante@univpm.it
Comeig	Irene	University of Valencia	Irene.comeig@virginia.edu
Corgnet	Brice	Chapman University	corgnet@chapman.edu
Debapriya	Paul	University of New South Wales, Sydney, NSW, Australia	d.paul@unsw.edu.au
Dijk	Oege	Radboud University	o.dijk@fm.ru.nl
Dong	xueqi	Royal Holloway, University of London	xueqidong77@gmail.com
Dzhemile	Ismail	Hochschule Rhein-Waal	dzhemile-ismet.ismail@hochschule-rhein-waal.de
Edward	Halim	Nanyang Technological University, Singapore	ehalim001@e.ntu.edu.sg
Fairley	Kim	Radboud University	Kim.Fairley@gmail.com
Fang	Dawei	University of Gothenburg, Gothenburg, Sweden	dawei.fang@cff.gu.se
Farjam	Mike	Friedrich Schiller University Jena	mike.farjam@uni-jena.de
Fattinger	Felix	University of Zurich	felix.fattinger@bf.uzh.ch
Füllbrunn	Sascha	Radboud University	s.fullbrunn@fm.ru.nl
Gortner	Paul	Goethe University	gortner@safe.uni-frankfurt.de
Grosshans	Daniel	University of Zurich	daniel.grosshans@uzh.ch
Hanaki	Nobuyuki	Aix-Marseille University	nobuyuki.hanaki@univ-amu.fr
Hegglin	René	University of Zurich, Switzerland	rene.hegglin@bf.uzh.ch
Hirota	Shinichi	Waseda University, Tokyo, Japan	shirota@waseda.jp
Holmen	Martin	University of Gothenburg	martin.holmen@cff.gu.se
Holzmeister	Felix	University of Innsbruck	felix.holzmeister@uibk.ac.at
Huber	Juergen	University of Innsbruck	juergen.huber@uibk.ac.at
Janssen	Dirk-Jan	Radboud University	d.janssen@fm.ru.nl
Jiangyan	Li	Radboud University	j.li@fm.ru.nl
Jörn	Sickmann	Hochschule Rhein Waal	joern.sickmann@hochschule-rhein-waal.de
Kayaba	Yutaka	Hitotsubashi University	yutaka.kayaba@r.hit-u.ac.jp
Kendall	Chad	University of Southern California	chadkend@marshall.usc.edu
Kirchler	Michael	University of Innsbruck	michael.kirchler@uibk.ac.at
Kitzelmann	Elke	University School of Management, Innsbruck, Austria	elke.kitzelmann@uibk.ac.at
Kleinlercher	Daniel	University of Innsbruck	daniel.kleinlercher@uibk.ac.at
Klos	Alexander	University of Kiel, Germany	alexander.klos@qber.uni-kiel.de
Koenigsheim	Christian	University of Hamburg, Hamburg, Germany	christian.koenigsheim@uni-hamburg.de
König-Kersting	Christian	Heidelberg University	christian.koenig@awi.uni-heidelberg.de
Kouwenberg	Roy	Mahidol University	roy.kou@mahidol.ac.th
Langnickel	Ferdinand	University of Zurich	ferdinand.langnickel@bf.uzh.ch
Li	Chen	Erasmus University	c.li@ese.eur.nl

Li	King King	City University of Hong Kong	likingking@gmail.com
Lin	Han	University of East Anglia, Norwich, Norfolk, UK	Han.Lin@uea.ac.uk
Lindner	Florian	University of Innsbruck, Austria	florian.lindner@uibk.ac.at
Lopez	Federico	Universitat de Valencia	federico.ramirez@uv.es
Lucks	Konstantin	University of Munich	konstantin.lucks@econ.lmu.de
Luhan	Wolfgang	Ruhr-University Bochum	wolfgang.luhan@rub.de
Lukas	Moritz	University of Hamburg, Hamburg, Germany	moritz.lukas@uni-hamburg.de
Mari	Konstantina	University of York, UK	km824@york.ac.uk
Massenot	Baptiste	Goethe University Frankfurt	baptistemassenot@gmail.com
Matsushima	Hitoshi	University of Tokyo	hitoshi@e.u-tokyo.ac.jp
Meissner	Thomas	Berlin University of Technology	meissnet@gmail.com
Meloso	Debrah	ESC-Rennes School of Business	debrah.meloso@esc-rennes.com
Mpoxou	Eirina	university of Boston	eirina_mpoxou@hotmail.com
Nadler	Amos	Ivey Business School	anadler@ivey.ca
Neugebauer	Tibor	University of Luxembourg	tibor.neugebauer@uni.lu
Nicklisch	Andreas	University of Hamburg	andreas.nicklisch@wiso.uni-hamburg.de
Niessen-Ruenzi	Alexandra	University of Mannheim	niessen@bwl.uni-mannheim.de
Noussair	Charles	Tilburg University	C.N.Noussair@uvt.nl
O'Briain	Tomas	University of Edinburgh	tobriain@gmail.com
Ortmann	Andreas	UNSW Business School	a.ortmann@unsw.edu.au
Palan	Stefan	University of Graz/University of Innsbruck	stefan.palan@uibk.ac.at
Papadovasilaki	Dimitra	University of Nevada, Reno	papadovasilaki@gmail.com
Paserman	Michal	Webster University Geneva	mpaserman@gmail.com
Peiran	Jiao	Univ. of Oxford	peiran.jiao@economics.ox.ac.uk
Petersen	Gesa-Kristina	LMU Munich, Munich, Germany	gesa-kristina.petersen@psy.lmu.de
Ploner	Matteo	University of Trento, Italy	matteo.ploner@unitn.it
Powell	Owen	University of Vienna	opowell@gmail.com
Prystav	Fabian	Ruhr-Universität Bochum, Germany	prystav@ikf.rub.de
Qiu	Jianying	Radboud University	j.qiu@fm.ru.nl
Razen	Michael	Department of Banking and Finance, University of Innsbruck	michael.razen@uibk.ac.at
Riyanto	Yohanes	Nanyang Technological University, Singapore	yeriyanto@ntu.edu.sg
Saltini	Tiphaine	HEC Paris	tiphaine.saltini@hec.edu
Schindler	David	Ludwig Maximilian University of Munich	david.schindler@econ.lmu.de
Schmelzer	André	Max Planck Institute for Research on Collective Goods, Bonn, Germany	schmelzer@coll.mpg.de
Schwieren	Christiane	Universität Heidelberg, Alfred Weber Institut für Wirtschaftswissenschaften, Germany	christiane.schwieren@awi.uni-heidelberg.de
Shestakova	Natalia	Department of Economics, University of Vienna, Austria	natalia.shestakova@gmail.com
Smith	Vernon	Chapman University	vsmith@chapman.edu
Smith	Candace	Chapman University	
Söderberg	Inga-Lill	Royal Institute of Technology, Centre for Banking and Finance, Stockholm, Sweden	ingalill.soderberg@abe.kth.se
Sonnemans	Joep	University of Amsterdam	joepsonnemans@gmail.com
Spickers	Theresa	LMU Munich	spickers@bwl.lmu.de
Sprenger	Julia	Ruhr-Universität Bochum	Julia.Sprenger@rub.de
Sproten	Alec	FAU Erlangen Nürnberg, Germany	alec.sproten@fau.de
Stefan	Matthias	Department of Banking and Finance, University of Innsbruck	matthias.stefan@uibk.ac.at
Trautmann	Stefan	University of Heidelberg	stefan.trautmann@awi.uni-heidelberg.de
Van Boening	Mark	University of Mississippi, University MS, USA	bmvan@olemiss.edu
Vlahu	Razvan	Dutch Central Bank	r.e.vlahu@dnb.nl
Vyrastekova	Jana	Radboud University	J.Vyrastekova@fm.ru.nl

Wada	Ryoko	Keiai University	nwada@u-keiai.ac.jp
Wang	Tong	Erasmus University Rotterdam and Tinbergen Institute	t.wang@ese.eur.nl
Weber	Jörg	University of Nottingham	joerg.weber@nottingham.ac.uk
Weber	Martin	Univ. Mannheim, Germany	profweber@yahoo.de
Weitzel	Utz	Radboud University/Utrecht University	u.weitzel@fm.ru.nl
Wolk	Leonard	Colby College	klwolk@colby.edu
Zajicek	Miroslav	University of economics in Prague	miroslav.zajicek@vse.cz
Zeisberger	Stefan	Stony Brook University, NY, USA	stefan.zeisberger@gmail.com