

2014 LabSi Workshop on Behavioral and Experimental Finance



2014 LabSi Workshop on Behavioral and Experimental Finance

September 12-13, 2014
University of Siena
Siena (Italy)

PROGRAM

Keynote Speakers

Michael Kirchler (University of Innsbruck)

Charles Noussair (Tilburg University)

Organizing Board

Marcello Basili, Valeria Faralla, Alessandro Innocenti, Luigi Luini, Alessandro Santoni

Partners

LabSi

EXPERIMENTAL ECONOMICS LABORATORY - University of Siena

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KEYNOTE SPEAKERS



Michael Kirchler is Professor of Finance at the Department of Banking and Finance of the University of Innsbruck and Visiting Professor at the Centre for Finance, Department of Economics, University of Gothenburg.



Charles Noussair is Arie Kapteyn Professor of Economics of Tilburg University, Tilburg, The Netherlands.

ORGANISING BOARD

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PROGRAM

FRIDAY 12TH SEPTEMBER

8:30-9:00	Registration and Welcome Address
9:00-10:15	<p>Session 1. Contagion</p> <p>Joshua Miller (Bocconi University, Milan), Martin Dufwenberg "Behavior in Parimutuel Betting Markets"</p> <p>Charles Noussair, Yilong Xu (Tilburg University) "Information Mirages and Financial Contagion in Asset Market Experiment"</p> <p>Oege Dijk (Radboud University Nijmegen) "Bank Run Psychology"</p>
10:15-10:45	<p>Keynote talk</p> <p>Charles Noussair (Tilburg University) "Trader Characteristics and Emotions in Experimental Asset Markets"</p>
10:45-11:00	Coffee break
11:00-11:50	<p>Session 2. Market Instability</p> <p>Sascha Baghestanian, Baptiste Massenet (Goethe University, Frankfurt), Ferdinand von Siemens "Prior Outcomes and Instability in Experimental Credit Markets"</p> <p>Owen Powell (University of Vienna) "Measuring Price Efficiency"</p>
11:50-13:05	<p>Session 3. Cognitive Biases</p> <p>Gabriele Camera, Marco Casari, Stefania Bortolotti (University of Bologna) "An Experiment on Retail Payments Systems"</p> <p>Carlos Cueva Herrero (Universidad de Alicante), Iñigo Iturbe, Giovanni Ponti, Josefa Tomás "An Experiment on the Disposition Effect"</p> <p>Giovanni Di Bartolomeo, Stefano Papa (University of Teramo), Francesco Passarelli "Why Do People Sometimes Not Keep Their Promises?"</p>
13.05-14.00	Lunch

FRIDAY 12TH SEPTEMBER

<p>14:00-15:15</p>	<p style="text-align: center;">Session 4. Ambiguity</p> <p>Daniela Di Cagno, Daniela Grieco (Bocconi University, Milan) "Endogenous versus Exogenous Ambiguity"</p> <p>Hippolyte d'Albis, Giuseppe Attanasi (University of Strasbourg), Emmanuel Thibault "Ambiguous Survival Probabilities and the Demand for Annuities: An Experimental Test through Charitable Giving"</p> <p>Marcello Basili (University of Siena), Alain Chateauneuf "Aggregation of Coherent Experts' Opinion: A Tractable Extreme-Outcomes Consistent Rule"</p>
<p>15.15-16:05</p>	<p style="text-align: center;">Session 5. Literacy</p> <p>Cecilia Boggio (University of Torino and CeRP), Elsa Fornero, Henriette Prast, Jose Sanders "Seven Ways to Knit Your Portfolio: Is Investor Communication Neutral?"</p> <p>Julia Sprenger (Ruhr-University Bochum) "Explanation or Advice: The Impact of Financial Literacy on Information Acquisition Behaviour"</p>
<p>16.05-16:20</p>	<p style="text-align: center;">Coffee break</p>
<p>16:20-17:35</p>	<p style="text-align: center;">Session 6. Risk-Taking</p> <p>Thorsten Lehnert, Yuehao Lin (University of Luxembourg) "Skewness Term Structure Tests"</p> <p>Diego Lubian, Chiara Nardi (University of Verona and Max Planck Institute of Economics) "Does Happiness Influence Financial Risk Taking? Evidence From Italian Data"</p> <p>Martin G. Kocher, Konstantin E. Lucks (Ludwig Maximilian University of Munich), David Schindler "Unleashing Animal Spirits - Self-Control and Bubbles in Experimental Asset Markets"</p>
<p>17:35-18:50</p>	<p style="text-align: center;">Session 7. Auction and Social Interaction</p> <p>Luigi Luini (University of Siena), Annamaria Nese, Patrizia Sbriglia "Social Influence in Trustors' Neighbourhoods"</p> <p>Giuseppe Attanasi (University of Strasbourg), Samuele Centorrino, Ivan Moscati "Zero-Intelligence and Human Agents in an Experimental Over-the-Counter Market"</p> <p>Patrick L. Leoni (Kedge Business School, Marseille) "Belief-Based IPO Underpricing"</p>
<p>20:30</p>	<p style="text-align: center;">Dinner</p>

SATURDAY 13TH SEPTEMBER

<p>9:00-10:15</p>	<p style="text-align: center;">Session 8. Social Interaction and Auction</p> <p>Sandro Casal, Matteo Ploner (University of Trento), Alec N. Sprotten "Your Money is in Good Hands - An Experiment about Pecuniary Sanctions and Accountability in Fiduciary Money Management"</p> <p>Sascha Baghestanian, Paul J. Gortner (Goethe University Frankfurt), Joel J. van der Weele "Peer Effects in Experimental Asset Markets"</p> <p>Gianluigi Albano, Roberto Di Paolo, Annamaria Paolillo, Giovanni Ponti (LUISS Guido Carli Roma and Universidad de Alicante), Marco Sparro "Absolute vs Relative Scoring in Experimental Procurement"</p>
<p>10:15-10:45</p>	<p style="text-align: center;">Keynote talk</p> <p style="text-align: center;">Michael Kirchler (University of Innsbruck) "Do Incentives Influence Trader Behavior and Market Prices?"</p>
<p>10:45-11:00</p>	<p style="text-align: center;">Coffee break</p>
<p>11:00-11:50</p>	<p style="text-align: center;">Session 9. Dynamic Choice</p> <p>Nicholas Feltovich (Monash University), Ourega-Zoe Ejebu "Do Positional Goods Inhibit Saving? Evidence from a Life-Cycle Experiment"</p> <p>Peter Bossaerts, Debrah Meloso (ESC Rennes School of Business), William Zame "Dynamically Complete Experimental Asset Markets"</p>
<p>11:50-13:05</p>	<p style="text-align: center;">Session 10. Numeracy and Learning</p> <p>Catalina Estrada-Mejia (Tilburg University), Marieke de Vries, Marcel Zeelenberg "Numeracy and Wealth"</p> <p>Tomás Ó Briain (University of Edinburgh) "Learning Behaviour of Individual Investors: Evidence from a Financial Betting Market"</p> <p>Davide A. Cecchini (University of Pisa), Lauren A. Kiesel, Evan Zheng "Ultimatum Game in the Prospect-Theory Framework"</p>
<p>13:05</p>	<p style="text-align: center;">End of the conference</p>

ABSTRACTS

FRIDAY 12TH SEPTEMBER

8:30-9:00 – Registration and Welcome Address

9:00-10:15 – SESSION 1. Contagion

- **Joshua Miller** (Bocconi University, Milan), Martin Dufwenberg
“Behavior in Parimutuel Betting Markets”

Parimutuel wagering markets have attractive features, both as test beds for financial market theory, and as mechanisms for aggregating information. Recent analyses of the role of private information in these markets suggest that its presence may induce informed bettors to refrain from betting until the final opportunity to bet, creating a simultaneous move game among informed bettors. We conduct a laboratory experiment to test theories of behavior in simultaneous move parimutuel betting markets.

- Charles Noussair, **Yilong Xu** (Tilburg University)
“Information Mirages and Financial Contagion in Asset Market Experiment”

We study financial contagion in an experimental market. There are two assets and an exogenous shock reduces the value of one of the two assets. Whether and how the other asset is affected depends on the correlation between the underlying values of the two assets. In some trials, the correlational relationship between the assets is unknown to all agents. In other trials, 50% of the traders are insiders who know the nature of the relationship between the assets. In periods with insiders, prices typically reveal private information. In periods without insiders, information mirages frequently occur, and can readily be interpreted as financial contagion that is unjustified by any underlying fundamental relationship. Our results suggest that under asymmetric information, traders may overreact to data from one market with their behavior in other markets.

Keywords: Experiment, Asset Market, Financial Contagion, Information Mirage.

- **Oege Dijk** (Radboud University Nijmegen)
“Bank Run Psychology”

There are two views on the mechanism for bank run contagions. One view states they are based on fundamentals and economic linkages between banks.

The other that they are based on psychology: the panic hypothesis. However there is no good existing theory on how bank run psychology affects decision-making. In this paper we test a theory that the presence of background fear changes decision-making and leads to a higher likelihood of bank runs. We test this through a bank run experiment where we induce background fear through an autobiographical reflection task. We find that in the fear treatment subjects are twice as likely to withdraw their deposits from a shaky bank than in the baseline treatment. Subjects in the fear treatment are also more likely to withdraw after observing previous withdrawals, but unlike in the baseline treatment are not more likely to keep their deposits in the bank after observing others do the same. Panic seems to be a one-way street.

10:15-10:45 – KEYNOTE TALK

- **Charles Noussair** (Tilburg University)
“Trader Characteristics and Emotions in Experimental Asset Markets”

The experimental literature on bubbles in asset markets shows that the incidence and magnitude of bubbles are affected by market parameters and institutions. However, even when these conditions are held constant, there are considerable differences between experimental sessions. This presentation considers the relationship between trader characteristics and market behavior. I consider the effect of trader risk and loss aversion, as well as cognitive sophistication. I also discuss the interactive relationship between emotional state and market behavior. Furthermore, I report some results on the effect of the time trajectory of fundamental values, and the introduction of futures markets, on mispricing.

10:45-11:00 – Coffee break

11:00-11:50 – SESSION 2. Market Instability

- Sascha Baghestanian, **Baptiste Massenet** (Goethe University, Frankfurt), Ferdinand von Siemens
“Prior Outcomes and Instability in Experimental Credit Markets”

Recent history suggests that credit markets are unstable. According to Minsky [1992], this instability would be inherent to these markets and not the result of exogenous aggregate shocks. We investigate this intriguing hypothesis by studying credit market experiments in the lab. Subjects play the role of

investors who have to borrow funds in a credit market to invest in a risky project. Importantly, we assume that no aggregate shocks hit the economy and that information about fundamentals is perfect, so investors operate in a stable and familiar environment. We find, however, that our experimental credit markets are unstable. When credit is scarce, the market interest rate tends to increase over time with some ups and downs and sometimes some crashes. When credit is plentiful, rates tend to decrease but also with some temporary ups and downs. Further analysis of the data suggests that prior outcomes of investors go some way in explaining these patterns because they affect both the beliefs and the preferences of investors.

- **Owen Powell** (University of Vienna)
"Measuring Price Efficiency"

Aggregation of price data forms an integral part of measuring the efficiency of markets. This paper shows that several issues exist with current aggregation techniques used in fields such as experimental asset markets. Based on these issues, the paper makes a set of recommendations that culminate in a new class of pricing measures. The recommendations are: 1) measure deviations relative to current fundamental value; 2) average over the entire market - avoid the use of intermediate indices; 3) when no transaction data is available, use order book information to estimate the market-clearing price; 4) use the geometric mean to average price indices; use the arithmetic mean for transactions. An application to experimental asset markets illustrates the sensitivity of mispricing measures to these issues. The magnitude of the adjustments involved suggest that the conclusions of previous research may easily be overturned.

11:50-13:05 – SESSION 3. Cognitive Biases

- Gabriele Camera, Marco Casari, **Stefania Bortolotti** (University of Bologna)
"An Experiment on Retail Payments Systems"

We study the behavioral underpinnings of adopting cash versus electronic payments in retail transactions. A novel theoretical and experimental framework is developed to primarily assess the impact of sellers' service fees and buyers' rewards from using electronic payments. Buyers and sellers face a coordination problem, independently choosing a payment method before trading. In the experiment, sellers readily adopt electronic payments but buyers do not. Eliminating service fees or introducing rewards significantly boosts the adoption of electronic payments. Hence, buyers' incentives play a pivotal role in the diffusion of electronic payments but monetary incentives

cannot fully explain their choices. Findings from this experiment complement empirical findings based on surveys and field data.

Keywords: Money, Coordination, Pricing, Transactions.

- **Carlos Cueva Herrero** (Universidad de Alicante), Iñigo Iturbe, Giovanni Ponti, Josefa Tomás
"An Experiment on the Disposition Effect"

This paper is an experimental investigation of the disposition effect (the tendency to sell profitable stocks too soon and hold losing stocks too long). In our baseline treatment (based on Camerer and Weber, 1998), subjects can buy and sell 6 different stocks over 10 periods which follow different price paths, independent of subjects' actions. We introduce two variations on the baseline treatment: the introduction of a trading tax, and a competitive payment scheme. All subjects go through the baseline treatment, the tax treatment, the competitive treatment and the tax plus competitive treatment (balancing the order).

We investigate gender differences in the disposition effect across these treatments, we also collect data on risk aversion, cognitive reflection, hormonal indicators and various psychological measures.

Keywords: Behavioral Finance, Experimental Economics, Disposition Effect.

- Giovanni Di Bartolomeo, **Stefano Papa** (University of Teramo), Francesco Passarelli
"Why Do People Sometimes Not Keep Their Promises?"

This paper investigates two theories that account for promise keeping. The first theory is motivated by guilt aversion when people dislike to let others' expectations down; the second theory argues that promises generate a sense of moral obligation, which is independent of others' expectations. A crucial aspect for testing these theories is understanding how communication yields to a promise and how the latter shapes expectations. We show that promise definitions may lead to biased interpretation of the experimental data. Moreover, we analyze in details the belief formation process and individuate the effects of cognitive biases. By defining a promise in a way that is consistent to data, we find that making a promise is not sufficient to make people feel a moral obligation. Sometimes people can go back on their promises. It is necessary that the one who promises also believes that he raised the partner's expectations. Only in this case, she feels guilty and honors her obligation.

Keywords: Cheap Talk, Promises, Moral Obligations, Cognitive Biases, Guilt Aversion, Beliefs, Psychological Games.

13:05-14:00 – Lunch

14:00-15:15 – **SESSION 4. Ambiguity**

- Daniela Di Cagno, **Daniela Grieco** (Bocconi University, Milan)
“Endogenous versus Exogenous Ambiguity”

Several real-life decisions have to be taken on the basis of probability judgments where the information needed by the decision-maker is partially or totally missing. This lack of information can derive from ambiguity on possible scenarios, odds and payoffs, or can result from ignorance on the individual relative position as compared to other individuals' characteristics or performance. In the former situation, the type of ambiguity affecting the decision-making process is generated by instances that are “exogenous” to the individual. In the latter case, ambiguity derives from the difficulty the individual experiences when evaluating her own capabilities or traits with respect to others' and is therefore “endogenous”. When it is the relative performance that matters, the decision to take part in a task can change dramatically according to self-evaluation with respect to peers: people are rarely well-calibrated and often show “over-” or “under-confidence”. In many situations, this systematic bias is also exacerbated by the difficulty of individuating the proper reference-group. Very few studies address the issues of ambiguity and overconfidence jointly. Both phenomena are not easy to measure, might present unclear responses to monetary incentives while interacting with risk-attitude, and are strongly context-dependent. Studies of confidence in own knowledge typically do not provide proper financial incentives: despite the popularity of elicitation of confidence intervals, this method might cause a deliberate misreport of confidence intervals due to strategic reasons (Cesarini et al., 2006). Furthermore, risk aversion might “dramatically affect the incentives to correctly report the true subjective probability of a binary event, even under Subjective Expected Utility” (Harrison et al. 2012, p.1). Among the studies that measure overconfidence by means of individuals' beliefs on own performance, Grieco and Hogarth (2009) investigate participants' choice of betting on their own relative performance in a task or on a 50-50 risky lottery, without knowing how well they did. Blavatsky (2009) deals with absolute performance, and asks participants to bet on their degree of accuracy or go with the risky lottery. Ambiguity attitude is measured separately and shows no relation with over- or under-confidence.

- Hippolyte d'Albis, **Giuseppe Attanasi** (University of Strasbourg), Emmanuel Thibault
"Ambiguous Survival Probabilities and the Demand for Annuities: An Experimental Test through Charitable Giving"

In this paper, ambiguity aversion to uncertain survival probabilities is introduced in a life-cycle model with a bequest motive to study the optimal demand for annuities. Provided that annuities return is sufficiently large, and notably when it is fair, positive annuitization is optimal in the ambiguity neutrality limit case. Conversely, the optimal strategy is to sell annuities in case of infinite ambiguity aversion. Then, in a model with smooth ambiguity preferences, there exists a finite degree of ambiguity aversion above which the demand for annuities is non-positive. To conclude, ambiguity aversion appears as a relevant candidate for explaining the annuity puzzle.

We tested our theoretical results through a laboratory experiment. First, a subject's coherent-ambiguity attitude has been elicited in a simple experimental setting able to make the smooth ambiguity model operational. Then, in a bond-annuity two-period decision problem, the subject's bequest in the second period has been presented as a contingent donation – contingent to surviving after the first period – to a previously chosen charity. We found that coherent-ambiguity-averse subjects invest less in annuities than coherent-ambiguity-neutral ones, and that the donation to the chosen charity is increasing in the investment in annuities. These findings confirm our theoretical predictions.

Keywords: Demand for Annuities, Uncertain Survival Probabilities, Smooth Ambiguity Model, Coherent Ambiguity Aversion, Laboratory Experiment, Charitable Giving.

- **Marcello Basili** (University of Siena), Alain Chateauneuf
"Aggregation of Coherent Experts' Opinion: A Tractable Extreme-Outcomes Consistent Rule"

The paper defines a consensus distribution with respect to experts' opinions by a multiple quantile utility model. The paper points out that the Steiner Point is the representative consensus probability. The new rule of experts' opinions aggregation, that can be evaluated by the Shapley value in a simple way, is prudential and coherent.

Keywords: Ambiguity, Aggregation, Steiner Point, Multiple Priors, Quantiles.

15:15-16:05 – SESSION 5. Literacy

- **Cecilia Boggio** (University of Torino and CeRP), Elsa Fornero, Henriette Prast, Jose Sanders
“Seven Ways to Knit Your Portfolio: Is Investor Communication Neutral?”

In this paper, we investigate whether (lack of) familiarity with the language used in the financial industry may contribute to an explanation of the findings that women participate less in the stock market than men, and that if they invest towards their pensions they take less risk than men. Using an interdisciplinary analysis combining insights from behavioural economics, finance, linguistics and social psychology, we study the metaphors used in websites that target beginning retail investors in three different languages: Dutch, English and Italian. We find that in all three languages the metaphors used in the investment language have physical activity, health, and war as their main source domains, i.e. the conceptual domains from which metaphorical expressions are drawn. We discuss whether these domains differ in their degree of familiarity to men and women, and draw the potential implications for policies aimed at reducing the gender gap in financial market participation, creating a level playing field for financial consumers and pension plan participants, and improving customer centricity in the life-cycle saving and investing industry.

- **Julia Sprenger** (Ruhr-University Bochum)
“Explanation or Advice: The Impact of Financial Literacy on Information Acquisition Behaviour”

Often, individuals have different types of information at choice to prepare decisions. Previous studies from the field of behavioral economics have shown that individuals usually prefer explanations over advice, suggesting egocentric advice discounting and a preference for decision autonomy.

This paper analyses individual decision-making in the field of personal finance. Specifically, a laboratory experiment investigates whether financial literacy influences information acquisition behaviour- and in which way.

Following a financial literacy test participants have to identify the financial product that best matches predetermined decision criteria in order to maximize their payoff. Two information environments are compared: In the first treatment, participants can buy explanations of specific attributes of the financial products in order to analyze their compliance with the decision criteria. In the second treatment, participants can also acquire a recommendation for a certain product (advice). Advice is more expensive than explanation but easier to process.

The results indicate that in an environment where explanations are the only source of information low financial literacy lowers the demand for information. This effect is reversed when explanations as well as advice are at choice.

Data from the second treatment show that, in general, demand for explanations exceeds demand for advice. But a low financial literacy significantly increases the reliance on advice. These findings suggest that low decision-specific knowledge increases the willingness to trade decision autonomy for a higher usability of information.

The impact of confidence and areas for future research are discussed as well.

16:05-16:20 – Coffee break

16:20-17:35 – SESSION 6. Risk-Taking

- Thorsten Lehnert, **Yuehao Lin** (University of Luxembourg)
“Skewness Term Structure Tests”

In this paper, we conduct skewness term structure tests to check whether the temporal structure of risk-neutral skewness is consistent with rational expectations. Because risk-neutral skewness is substantially mean reverting, skewness shocks should decay quickly and risk-neutral skewness of more distant option should display the rationally expected smoothing behavior. Using an equilibrium asset and option-pricing model in a production economy under jump diffusion with stochastic jump intensity, we derive this elasticity analytically. In an empirical application of the model using more than 20 years of data on S&P500 index options, we find that this elasticity turns out to be different than suggested under rational expectations – smaller on the short end (underreaction) and larger on the long end (overreaction) of the ‘skewness curve’.

Keywords: Asset Pricing, Skewness Term Structure, Option Markets, Central Moments, Risk Compensation, Risk Aversion.

- Diego Lubian, **Chiara Nardi** (University of Verona and Max Planck Institute of Economics)
“Does Happiness Influence Financial Risk Taking? Evidence From Italian Data”

The influence of happiness on financial risk taking has been mainly studied using experimental data or looking at subjective or hypothetical measures of risk. However, even though these kinds of risk indicators are intuitively appealing and a good starting point, it is not possible to rule out that subjects would behave differently when dealing with real portfolio decisions. The

present study is an attempt to filling the gap in the literature and to deepen the analysis by considering not only answers to subjective or hypothetical questions, but also several objective financial risk measures which are inferred from observed portfolio allocations. Using data on Italian households for 2008, we find that happiness has always a positive and significant effect on risk taking, once controlled for wealth, financial literacy and other observable demographic characteristics. In other words, our results document that happier people tend to be more risk seeking in financial situations, irrespectively of the chosen measure of risk.

- Martin G. Kocher, **Konstantin E. Lucks** (Ludwig Maximilian University of Munich), David Schindler
“Unleashing Animal Spirits - Self-Control and Bubbles in Experimental Asset Markets”

We exogenously vary the ability to exert self-control of traders in experimental asset markets. Markets with participants with lower self-control capacities exhibit substantially higher price bubbles. Not only does mispricing increase compared to the control condition, but also overpricing is larger when participants lack the resources to exert self-control. Our treatment effect cannot be explained by differences in cognitive capacities or risk attitudes, since measures for both seem unaffected by our treatment. This study therefore suggests that reduced self-control can contribute to the emergence of bubbles in experimental markets.

17:35-18:50 – SESSION 7. Auction and Social Interaction

- **Luigi Luini** (University of Siena), Annamaria Nese, Patrizia Sbriglia
“Social Influence in Trustors’ Neighbourhoods”

We offer new and clean evidence that social interactions impact on individuals’ choices. In an experimental trust game we study whether and how trustor’s behaviour is affected by social influence of other trustors’ choices time after time. We account for three important factors of trustors’ preferences: risk attitude, generosity and expected trustworthiness. Our results confirm that trustor’s behaviour is affected by peers. We find a general convergence in trusting behaviour: the effect of social influence is (for most of subjects) significantly reducing the amount sent by trustors in each period. Furthermore, analyzing contagion within the neighbourhoods, we find that agents tend to imitate similar types ((un)-generous or (un)trusting) when placed in the same neighbourhood. Indeed - in the few neighbourhoods with a prevalence of generous and risk-loving subjects - trust substantially increases over time.

Nearness, without any strategic component, is a clear element of contagion in trustors' behaviour.

Keywords: Investment Game, Experiments, Peer effects, Imitation.

- **Giuseppe Attanasi** (University of Strasbourg), Samuele Centorrino, Ivan Moscati
"Zero-Intelligence and Human Agents in an Experimental Over-the-Counter Market"

Experimental markets working under double auction have been designed so far to understand the equilibrium and the efficiency of competitive markets (in particular, financial markets) and to prove that automata can do as well as humans when they trade under simple rules.

In this paper, we use an experimental over-the-counter market to understand the behavior of agents when they are not provided information about asks and bids. This setting is equivalent to a search market in which every agent is looking for the best trading counterpart. We compare the over-the-counter to the double-auction mechanism by integrating experimental and computational techniques, i.e. not only in markets with human agents but also by bringing into play zero-intelligence agents à la Gode and Sunder (1993).

With respect to the standard Smith's (1962) experimental double auction market, we find evidence that the reduction in information in the over-the-counter market is sharply reducing market efficiency, because of available units left out of the market. However, we find that the over-the-counter market is converging to a long term equilibrium price. Furthermore, differences in efficiency between markets with zero-intelligent traders and markets with human agents are greater under an over-the-counter than under a double-auction mechanism.

We argue that we can apply our experimental results to financial markets, when agents are not market makers, but they are trading through brokers, so that they post offers based on closing prices only; and to commodity markets, for which a publicly available book does not exist.

- **Patrick L. Leoni** (Kedge Business School, Marseille)
"Belief-Based IPO Underpricing"

We consider IPO issuances as multi-units auctions, where privately informed bidders are risk-averse. At the optimal IPO and fixed-price auctions, we show that when individual beliefs about the valuation of the shares increase in the sense of either first-order or second order stochastic dominance, the equilibrium price decreases. For Walrasian auctions (or book-building IPOs), this result is not true in general and underpricing may occur because of collusion.

Keywords: IPO Underpricing, Stochastic Dominance, Multi-unit Auction, Collusion.

20:30 – Dinner

SATURDAY 13TH SEPTEMBER

9:00-10:15 – SESSION 8. Social Interaction and Auction

- Sandro Casal, **Matteo Ploner (University of Trento)**, Alec N. Sproten
“Your Money is in Good Hands - An Experiment about Pecuniary Sanctions and Accountability in Fiduciary Money Management”

Very often (risky) economic and financial decisions are taken by individuals who not only do not bear the decisions' consequences, but also have incentives to act against the interests of another party: in other words when decisions are taken on behalf of others, it is very likely that an agency dilemma occurs. An example of this kind of situations is asset management: here the Principal (Investor) looks for efficient portfolio meeting her risk propensity, and the Agent (Investment Manager) has an incentive to trade in risky stocks given that her fees are often proportional to the traded amount (management fee) and left-truncated (performance fees).

With this work, we want to contribute to the (experimental) literature on delegated risky decisions which have attracted much less attention than individual risky decisions: when decisions on behalf of others are studied, results are often contradictory and, even more importantly, the source of the agency dilemma (monetary conflict of interest) is generally ignored (for example, see Chakravarty et al., 2011; Eriksen and Kvaly, 2010).

We skirt this limitation by introducing, in our experimental design, an explicit trade-off in players' payoffs.

As far as we know, only Agranov et al. (2013) have studied decisions on behalf of others in presence of monetary conflict of interests. These authors found a general tendency of increasing risk propensity when investing others' money. Although the presence of an explicit conflict of interest is a common feature in this work, contrary to Agranov et al. (2013), who studied the impact of trade-off in payoffs on competition among fund managers, we focus the attention on policy interventions aimed to reduce the possibility of opportunistic behavior of

managers. We refer to opportunistic behavior when a manager tries to take advantage of her privileged position in the financial relationship in order to maximise her own profit. We therefore examine the following main questions:

1. Do managers respect their clients' risk preferences when managing their money?

2. Do managers take advantage of the opportunity offered by managing others' money for

pursuing their own interests even if this implies a loss of welfare for the counterpart?

If yes: Can managers' compliance be enforced and sustained with a threat of punishment and/or with perfect accountability of managers' investment strategies?

Keywords: Delegated Risky Decisions, Monetary Conflict of Interest, Experiments.

- Sascha Baghestanian, **Paul J. Gortner** (Goethe University Frankfurt), Joel J. van der Weele
"Peer Effects in Experimental Asset Markets"

Peer effects are an important determinant of individual investment decisions. They might become even more important, since new technologies such as online social trading platforms promote investing as a social activity. While many studies show the impact of peer effects on individual decisions, their influence on market outcomes is not as well understood. Using an experimental asset market, we examine the impact of peer effects on aggregate risk taking. The market features two negatively correlated assets, so trading can reduce aggregate risk. We compare aggregate risk among three treatments. In a baseline treatment, traders get not information about peers(*i.*). Peer effects are introduced via a means of social comparisons. Traders see the portfolios of a subset of other traders in a market. Each subset of traders constitutes a peer group. In every peer group, we facilitate social comparisons by either highlighting the best(*ii.*) or the worst performer(*iii.*).

When highlighting the worst performer, we observe a significant treatment effect. Aggregate risk taking is lower than in the baseline treatment. Highlighting the best performer yields an intermediate result. Aggregate risk taking is lower, than in the baseline treatment, but higher than when highlighting the worst performer. However, neither difference is significant. Additionally, we examine the impact of per session average trader characteristics on aggregate risk taking. Higher average risk aversion, leads to lower aggregate risk taking. Moreover, a more pro-social group of traders takes ceterbis paribus lower risk, when information about peers is displayed.

With respect to prices, we find mixed results. Price levels are not significantly different between treatments. The price level for each session is highly idiosyncratic. We find a significant treatment effect on price volatility. Volatility is lower in sessions, where subjects get information about their peers.

Thus, we show that peer effects can dampen risk taking in financial markets, especially when people are afraid to earn less than others.

Keywords: Experimental Finance, Peer Effects.

- Gianluigi Albano, Roberto Di Paolo, Annamaria Paolillo, **Giovanni Ponti** (LUISS Guido Carli Roma and Universidad de Alicante), Marco Sparro
"Absolute vs Relative Scoring in Experimental Procurement"

We compare two of the two most popular classes of mechanisms used in real-life procurement: absolute and relative scoring rules. The former are those functions which assign to each tender, and for each dimension to be evaluated, a score which is independent from the other submitted tenders; the latter are those functions that the score assigned to one tender depends on the tenders submitted by some of -or all- the other competitors.

Our experimental design consists in two treatments (between-subject design), in which absolute (T1) and relative (T2) scoring rules are employed, respectively. T2 is run first, so that we can employ the same parameters of the scoring functions (endogenously determined by bidders' behavior) observed in T2 to calibrate the absolute scores of T1, to be submitted in later sessions to a different subject sample. This allows to identify the role of bid interdependence in subjects' bidding behavior and, in consequence, in the resulting market efficiency.

Keywords: Procurement Auctions, Mechanism Design, Experimental Economics.

10:15-10:45 – KEYNOTE TALK

- **Michael Kirchler** (University of Innsbruck)
"Do Incentives Influence Trader Behavior and Market Prices?"

How people are incentivized is one of the main drivers of how they behave. In laboratory asset markets we evaluate the impact of four trader incentive bonus, bonus with cap, linear, and penalty – on asset prices and trader behavior. We find that (i) an asset with identical expected dividend shows price levels which differ by more than 100 percent depending on the incentive scheme subjects face. In particular, prices of markets populated by subjects with bonus incentives show the highest prices, whereas those with penalty-like incentivized subjects exhibit the lowest. (ii) However, subjects act approximately rational as different incentives generate different optimal price levels. (iii) In markets where different subjects have different incentive schemes we find that those with bonus incentives exhibit a riskier investment behavior and prefer the riskier asset, whereas subjects with penalty incentives invest conservatively and mainly hold cash. Since we find no difference in risk

attitude of subjects prior to the experiment, differences in investment behavior are induced by the applied incentives. Our results highlight that incentives on financial markets have a huge impact on asset prices and investment behavior.

10:45-11:00 – Coffee break

11:00-11:50 – SESSION 9. Dynamic Choice

- **Nicholas Feltovich** (Monash University), Ourega-Zoe Ejebu
“Do Positional Goods Inhibit Saving? Evidence from a Life-Cycle Experiment”

We investigate the effect of *positional goods* (goods for which one's consumption relative to others' matters) on saving, based on results from a life-cycle consumption/saving experiment. In a *Group* treatment, we allow inter-personal comparisons by assigning subjects to groups and displaying rankings based partly on consumption. A baseline *Individual* treatment is similar, but without the additional information. We find more under-saving (saving less than the optimal amount), and lower money earnings for subjects, in the Group treatment. Both effects are economically relevant, with magnitudes of roughly 6-7% of expected income and 7-8% of average earnings respectively. Additional analysis shows that the result is driven by those subjects who are not ranked in the top three in their group ("keeping up with the Joneses"), and males in particular.

- Peter Bossaerts, **Debrah Meloso** (ESC Rennes School of Business), William Zame
“Dynamically Complete Experimental Asset Markets”

We design an experiment to compare investors' final wealth distribution in a static setup and an equivalent dynamic setup. In the static setup investors can trade all risks since there are as many securities as states of the world. In the dynamic market there are too few securities for investors to achieve efficient final wealth holdings without re-trade. Information disclosure and the possibility of re-trade in our experimental markets are such that markets can be *completed* over time via appropriate re-trade after information disclosure. Thus, investor final wealth and state security prices are predicted to be identical across the two considered setups. We find that some important differences persist across treatments, even after several iterations of the same situation. We introduce the notion of *price risk aversion* as a possible source of the observed differences.

Keywords: Dynamic Completeness, Completeness, Radner Equilibrium, Temporary Equilibrium, State (or Arrow-Debreu) Securities.

11:50-13:05 – SESSION 10. Numeracy and Learning

- **Catalina Estrada-Mejia** (Tilburg University), Marieke de Vries, Marcel Zeelenberg
“Numeracy and Wealth”

We examined the relationship between numeracy and wealth using a cross-sectional and a longitudinal study. Numeracy, defined in the broadest sense, is the ability to understand and use numeric concepts. For a sample of approximately 1000 Dutch adults, we find an economically relevant and statistically significant correlation between numeracy and wealth, even after controlling for differences in risk preferences, financial knowledge, beliefs about future income, and need for cognition. Conditional on socio-demographic characteristics, our estimates suggest that on average a one-point increase in the numeracy score of the respondent is associated with 5 percent more personal wealth. Additionally, we find that numeracy is a key determinant of the wealth accumulation trajectories that people follow over time. Over a 5-year period, while participants with low numeracy decumulate wealth, participants with high numeracy maintain a constant positive level of wealth.

Keywords: Numeracy, Cognitive Ability, Wealth, Wealth Accumulation.

- **Tomás Ó Briain** (University of Edinburgh)
“Learning Behaviour of Individual Investors: Evidence from a Financial Betting Market”

Individual preference models assume that agents are rational while empirical research in the area of behavioural finance has suggested otherwise. The possibility of irrational agents in a competitive market is accounted for with the following proposals: (a) irrational agents execute trades randomly and their net effect is negligible, (b) irrespective of trading by irrational agents, a subset of informed arbitrageurs insure that prices are efficient or (c) prices approach equilibrium as agents 'learn by trading'. However, if investors do not learn in a rational Bayesian fashion and instead suffer from a similar bias to that set out in the naïve reinforcement hypothesis, this assumption may not hold. To that effect, as suggested by Barberis and Thaler (2003), the 'continued empirical scrutiny of assumed behaviour is essential to validating the claims of behavioural finance theorists.

Bayesian learning refers to weighing both 'experienced' and 'observed' outcomes equally whereas reinforcement learning over-weighs 'experienced' outcomes. Reinforcement learning dictates that agents should stick to given

choices as long as they generate rewards, otherwise they should switch. Empirical testing of behavioural finance theory is complicated by a paucity of transactional panel data. A response to this is to turn to a laboratory setting as is common in the experimental economics literature. However, respondents in such experiments may not always be sampled randomly and the costs associated with providing respondents with adequate consideration as to make the contingent claims being traded economically significant are prohibitive. Indeed, Brav and Heaton (2002) note that learning in experiments requires immediate outcomes while Russell and Thaler (1985) state that without well-structured feedback, learning may be negligible.

By using a longitudinal dataset comprising in excess of 1.5 million individual-level fixed-odds financial bets we have a natural-experimental setting with which to test Bayesian and reinforcement learning theories. The sample includes transactions from more than 10,000 customers from an online bookmaker on major stock indices and also on a random-number generated market (Virtual Market), a similar dataset to that exploited by academics performing empirical tests of behavioural finance theories with brokerage data. In our setting, bettors are performing identical, consecutive decisions which mimic financial choices made in a laboratory, but the use of their own funds departs from the artificiality of an experiment. Also, in contrast with learning in an IPO setting, for example, not only is this a clean experiment (i.e. with no 'hot' and 'cold' IPOs or issue-specific characteristics) but there is also a relatively short time between action and response which should facilitate more expedient learning. We further assess how behaviour changes according to different learning outcome paths. It constitutes the first analysis of the financial fixed-odds betting market, and in doing so, sheds light on the activities of relatively recent entrants into the market-making sphere: traditional sports bookmakers. We therefore extend the work of Choi et al. (2009), Pastor and Veronesi (2009), Seru et al. (2010), and Strahilevitz et al. (2011), while also shedding light on a heretofore opaque market setting.

- **Davide A. Cecchini** (University of Pisa), Lauren A. Kiesel, Evan Zheng
"Ultimatum Game in the Prospect-Theory Framework"

Theoretically, individuals participating in the Ultimatum Game should offer the smallest amount of money possible to their counterparts and also accept the smallest amount of money they are offered. However, it has been experimentally demonstrated that this is not the case. This paper will start discussing an experiment consisting of 10 trials of the Ultimatum Game done in a class of college students in July 2013. During this experiment, the Ultimatum Game behavior pattern is respected consistently with previous experiments (such as the 75 experiments analyzed in 2004, Oosterbeek et. al). Using graphical software, possible learning patterns were analyzed and loss averse behavior shown in the game played was put in correlation to the

Prospect Theory model. This pairing shown a certain correlation between the behavior of the Ultimatum Game and the Prospect Theory model, suggesting a correlation between the two behaviors. In particular, what is discussed is the correlation between the indifference point of the Prospect Theory model (fixed at 33.3 units) and the indifference point of the Ultimatum Game (at 33.9 for our experiment, consistent with the Ultimatum Game literature), so that may be a precise loss aversion behavior, in the Prospect Theory fashion, that occurs when subjects evaluate the minimum viable offer to be accepted or refused in an Ultimatum Game.

END OF THE WORKSHOP