BOOK OF ABSTRACTS

SOCIETY *for* ECONOMIC DESIGN

Conference *on* **Economic Design 2015**

İstanbul Bilgi University, Turkey   July 1-4, 2015

MURAT SERTEL CENTER FOR ADVANCED ECONOMIC STUDIES

İstanbul Bilgi University
LAUREATE INTERNATIONAL UNIVERSITIES

Parallel Sessions July 2 (9.00 -11.00)

Aggregation and Disaggregation

- **Bedrosian G. (Bielefeld University)**
Microeconomic Foundations of Representative Agent Models By Means of Ultra products

This paper applies microeconomic foundations to construct a "representative agent". Herzberg [12] constructed a representative utility function for finite-dimensional social decision problems and since the decision problems of macroeconomic theory are typically infinite-dimensional, Herzberg's original result is insufficient for many applications. We therefore generalise his result by allowing the social alternatives to belong to a general reflexive Banach space and provide sufficient conditions for our new results to be satisfied in Economic applications.

- **Börgers T. (University of Michigan)**
Reformulation of the Axiomatic Foundations of Relative Utilitarianism

We consider the aggregation of individual agents' von Neumann-Morgenstern's utility functions into a societal von Neumann-Morgenstern utility function. We start from Harsanyi's [7] axiomatization of utilitarianism, and ask under which conditions a social preference order that satisfies Harsanyi's axiom uniquely reveals society's marginal rates of substitution between the probabilities of any two agents' most preferred alternatives. We then introduce three axioms for these revealed marginal rates of substitution. Our main result is that the only welfare function that satisfies these three axioms is the relative utilitarian welfare function. This welfare function, that was introduced in Dhillon [5] and Dhillon and Mertens [6], normalizes all agents' utility functions so that the lowest utility value is 0 and the highest utility value is 1, and then adds up the utility functions. The three axioms that we introduce are closely related to axioms that Dhillon and Mertens used to provide foundations for relative utilitarianism, but our axioms allow a much simpler and more transparent derivation of the main result.

- **Maraun N. (University of Paderborn)**
Disaggregating Consumer Evaluations

We consider a market where final products or services are compositions of a number of intermediary goods or resources. Customers are asked to evaluate the quality of the composed product after purchase. Typically, the quality of intermediary goods is not observable and hence cannot be evaluated. The question we tackle is whether it is possible to use consumer evaluations on final products to assess the quality of intermediary goods. As there are many consumers evaluating, two questions arise. First, how should we aggregate evaluations across customers? And second, how should we disaggregate information on composed products to arrive at a valuation of components? In our work we examine different aggregation and disaggregation methods regarding their consistency. Our focus is especially on the Shapley value as a disaggregation method and the (weighted) average as an aggregation method. The resulting evaluation is consistent and gives some interesting insights about the heterogeneity of the market.

- **Nebioğlu D. (İstanbul Bilgi University)**
Wealth Effects and Labour Supply: An Experimental Study

The use of Greenwood et al. [1988] (GHH) preferences which imply that labor/leisure decision is independent of consumption decision to solve some puzzles in macroeconomic literature has become widespread after Jaimovich and Rebelo [2009] proposed a generalized preference specification consistent with a balanced growth path which nests King et al. [1988] and Greenwood et al. [1988] preferences as extreme cases. This generalized utility function allows for scaling wealth effects on labor supply hence GHH utility assumption can be used without distorting steady state properties of the

models. However, there is little and mixed empirical evidence regarding the wealth elasticity of labor supply. Using a real effort experiment design, we try to test behavioral foundations of GHH preferences. In particular, we try to elicit subjects' innate preferences for leisure using the BDM Mechanism proposed by Becker et al. [1964] and we try to test if these preferences change in response to unexpected changes in non-labor income. Using a within subject design, we find that approximately 19 % of the subjects increase their reservation wages in response to unexpected positive income shocks.

Allocations 1

- **Ko C.Y. (National University of Singapore)**
  Division of a Resource in a Grid Network

A problem consists of a finite group of agents and a finite rectangular grid network with non-negative value attached to every link in the grid. A solution selects, for every problem, a non-decreasing path that connects the origin with the opposite corner of the grid, and split the sum of the values of the links in the selected paths among the agents. A solution is path-consistent if for any given point in the path selected by the solution, the path chosen in the sub-grid formed by that point and the opposite corner of the grid is the remaining of the path selected by the solution. A solution is consistent if it is path-consistent and the value given to an agent is independent on whether the distribution is made at any point in the middle of the path. There is a large class of path-consistent solutions, including: the maximalist path (the selects the path with the largest sum), the minimalist path (that selects the path with the smallest sum) or the myopic path (which selects the link with the largest value among the next two). The paper characterizes the entire class of path-consistent solutions. A description of a large subset of consistent solutions as the maximization of an additively separable function is provided. We also provide a description of the consistent solutions. They require to pick a path-consistent solution and splits the value of a path using an arbitrary function that depends on the value of every link and the direction in which the path is moving. Finally, the paper considers the problem of implementation. We ask which solutions provide agents the incentives to pick the efficient path as a Subgame Perfect Nash equilibrium of the game where they alternatively pick the direction of the path.
Surprisingly, only a very small class of solutions meets this requirement. They must pick the efficient path and split the value using an arbitrary monotonic function that depends on the aggregate value of a path. The proportional sharing solutions, where the value of every selected link is split in the same proportion to the agents, are the only consistent solutions that implement the efficient path. The equal sharing solution, where the value of every selected link is split equally among the agents, is the only symmetric method in the class.

- **Saral A.S. (University of Trento)**
  An Agent-based Model of Open-Source Software Development

In this study, we analyze open-source software production by using a computational agent-based model with three types of agents: Users, developers and maintainers. We evaluate quality and the scale of an open-source software project, as it is determined by the interaction between the agents and the institutional governs this interaction. By this model, we search possible efficiency improvements by altering collective decision rules and the formation of the population.

- **Ertemel S. (İstanbul Technical University)**
  Ex-ante versus Ex-post Proportional Rules for State Contingent Claims

We consider rationing problems where the claims are state contingent, i.e., each agent submits a claim for very state in stage one and the realization of state happens in stage two. A rule must distribute the resources in the first stage before the realization of the state of the world. We introduce two natural extensions of proportional rules in this framework, namely, ex-ante and ex-post proportional rules, and characterize them using axioms standard in literature.

- **Xue J. (Singapore Management University)**
Claim uncertainty and egalitarian division with wastage

The pre-committed division with uncertain needs has significant practical relevance but is lack of a theoretical analysis. A new issue here, which does not exist in other models of distributive justice, is the possibility of producing waste when the allocated amount turns out to exceed the realized demand. This paper investigates egalitarian solutions to pre-committed division problems. We propose a set of fairness criteria which incorporate the concern of waste. We axiomatize the class of waste constrained uniform gains rules as well as several interesting subclasses of it

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Auctions 1

- **Segev E. (Ben-Gurion University of the Negev)**
Sequential Bidding in Asymmetric First Price Auctions

We study asymmetric first price auctions in which bidders place their bids sequentially, one after the other and only once. We show that with a strong bidder and a weak bidder (in terms of first order stochastic dominance of their valuations' distribution functions), already with small asymmetry between the bidders, the expected revenue in the sequential bidding first price auction (when the strong bidder bids first) is higher than in the simultaneous bidding first price auction. Moreover it is higher than the expected revenue in the second price auction. The expected payoff of the weak bidder is also higher in the sequential first price auction. Therefore a seller interested in increasing revenue facing asymmetric bidders may find it beneficial to order them and let them bid sequentially instead of simultaneously. In terms of efficiency, both the simultaneous first price auction and the sequential first price auction cannot guarantee full efficiency (as opposed to a second price auction). The sequential bidding auction when the stronger bidder bids first achieves lower efficiency than the simultaneous auction. However, when the order is reversed and the asymmetry is large enough the sequential first price auction achieves higher efficiency than the simultaneous auction.

- **Yang Z. (University of York)**
An Efficient Multi-Item Dynamic Auction with Budget Constrained Bidders

An auctioneer wishes to sell several heterogeneous indivisible items to a group of potential bidders. Each bidder has valuations over the items but may face a budget constraint and therefore be unable to pay up to his values. In such markets, Walrasian equilibrium may fail to exist. We develop a novel dynamic auction and prove that the auction always finds a core allocation. In the auction prices that have been increased can be later decreased if they have become too high. The core allocation consists of an assignment of the items and its associated supporting price vector, achieves Pareto efficiency, and is robust against the threat of deviation by any coalition of market participants.

- **Derbyshire D. (University of Birmingham)**
Sequential Equilibrium and Moral Hazard Auctions

We present the results of an experiment that implements the sequential equilibrium framework, where the stage game is a moral hazard auction in which the seller can choose not to send the good. We introduce a commitment type seller who always sends the good (overcoming the moral hazard) with some prior probability. We find that as the prior probability on these commitment type increases, bidders on average place higher bids, as predicted by a theoretical model we develop. We also find limited evidence that sellers respond to the presence of the commitment type by increasing the probability with which they send the good in early periods, consistent with the canonical sequential equilibrium literature in which agents attempt to mimic existing commitment types. As with much of the literature of sequential equilibrium, there is significant deviation from equilibrium. Nonetheless, we find patterns of behavior that are broadly consistent with the qualitative features of such a model of reputation formation and conclude that sequential equilibrium (adverse selection) reputation effects remain an important consideration in such settings.

- **Delnoij J. (Utrecht University)**
Competing First Price and Second Price Auctions

This paper theoretically investigates which auctions—first price or second price auctions—will be selected by revenue-maximizing sellers when allowing for endogenous entry by risk averse bidders. In order to answer this question, we first look at bidders' entry decisions into these auctions. We find that when bidders may choose between entering the first price and second price auction, the number of bidders entering each mechanism depends on their degree of absolute risk aversion. If bidders exhibit risk neutrality or constant absolute risk aversion, they will enter each auction with equal probability. If bidders exhibit decreasing absolute risk aversion, however, more bidders will enter the second price auction, whereas if bidders exhibit increasing absolute risk aversion more bidders will enter the first price auction. We further find that a monopolist who owns two items of a homogeneous commodity prefers to sell both items in two simultaneous first price auctions. Sellers in a duopoly also have a dominant strategy to select first price auctions when bidders exhibit constant or increasing absolute risk aversion. We demonstrate by example that the same is true when bidders exhibit decreasing absolute risk aversion.

Game Theory 1

- **Duman P. (İstanbul Bilgi University)**
An Exact Non-Cooperative Foundation for Nash Solution

Binmore, Rubinstein and Wolinsky(1986)] analyzes the relation between the static axiomatic theory of bargaining and the sequential strategic approach to bargaining and considers two related - but different in the employed utility functions - strategic models of alternating offers based on [Rubinstein(1982)]. These models provide approximate non-cooperative supports for the Nash solution, but not a limit model with an exact non-cooperative support. In our paper, we first provide a modification of the Rubinstein game that allows such an exact non-cooperative support in weakly subgame perfect equilibrium and in the light of this modification, we prove a direct non-cooperative support in sub-game perfect equilibrium. In both games, there is an infinite number of (weakly) subgame perfect equilibria, but all have the same payoffs namely those of the Nash bargaining solution in the utility space generated from the respective underlying utility functions of the two models. Finally, we discuss the relation of our non-cooperative support results (in the sense of the Nash Program) to mechanism theoretic implementation in (weakly) subgame perfect equilibria

- **Yamamura H. (Tokyo Institute of Technology)**
A Simple and Dynamically Stable Nash Mechanism for the Division Problem with Single-dipped Preferences

We introduce a mechanism, termed the simple binary mechanism, for the division problem with single-dipped preferences. Under the simple binary mechanism, each agent reports whether he wants a resource or not and the resource is divided equally among agents who want it. We show that while any selection from the strong Pareto solution does not satisfy Maskin monotonicity, any Nash equilibrium allocation of the simple binary mechanism is weakly Pareto efficient. We also show that if the set of strong Pareto efficient and no-envy allocations is not empty, then it coincides with the set of strong Nash equilibrium allocations of the simple binary mechanism. We additionally show that the simple binary mechanism is Cournot stable. That is, from any message profile, any preference improvement path converges to a Nash equilibrium.

- **Chakrabarti S. (Queen's University)**
Partial Cooperation in Strategic Decision Situations

We consider a normal form game in which there is a single coalition of cooperating players who can write a binding agreement. The coalition under consideration only writes binding agreement with regard to a particular action, while other actions remain under the complete, individual control of the players. Several

equilibrium concepts are developed and analyzed. We apply this game theoretic framework to existing models of multi-market oligopolies and emission controls.

- **Mc Quillin M. (University of East Anglia)**
Backward Induction Foundation for the Shapley Value

We present a non-cooperative game model of coalitional bargaining, closely based on that of Gul (1989) but solvable by backward induction. In this game, Gul's condition of 'value additivity' does not suffice to ensure the presence of a subgame perfect Nash equilibrium that supports the 'generalized Shapley value', but a related condition - 'no positive externalities in the value' - does. Multiple equilibria can arise only in the event of ties, and for a wide variety of tie-break rules these equilibria all support the same value. 'No positive externalities in the value' also suffices to ensure that in Gul's original game all stationary subgame perfect Nash equilibria support the generalized Shapley value, and that on the broader class of underlying games in partition function form both Gul's game and ours support the 'extended, generalized Shapley value' of McQuillin (2009).

Matching 1

- Akahoshi T. (Waseda University)
Acyclicity and the Self-Contained Expectation of the Core In Matching Problems

This paper studies a further stability property of the core, called the self-contained expectation, in many-to-one (student-to-college) matching markets. The core, which is the set of unblocked allocations, has an appealing property as a single allocation instead of a set of allocations. On the other hand, this paper seeks for another appealing property as a set. We say that the core satisfies the self-containedness of expectation if any individual rational non-core matching is blocked by a pair that is matched under some core matching. We provide an acyclicity condition on profiles of the colleges' preference relations, called weak acyclicity, and show that the condition is satisfied if and only if the core always satisfies the self-containedness of expectation for each profile of the students' preference relations.

- **Ehlers L. (University of Montreal)**
Object Allocation via Deferred-Acceptance: Strategy-Proofness and Comparative Statics

We study the problem of assigning indivisible and heterogeneous objects (e.g., houses, jobs, offices, school or university admissions etc.) to agents. Each agent receives at most one object and monetary compensations are not possible. We consider mechanisms satisfying a set of basic properties. In the house allocation problem, where at most one copy of each object is available, deferred-acceptance (DA)-mechanisms allocate objects based on exogenously fixed objects' priorities over agents and the agent-proposing deferred-acceptance algorithm. For house allocation we show that DA-mechanisms are characterized by our basic properties and (i) strategy-proofness and population-monotonicity or (ii) strategy-proofness and resource-monotonicity. Once we allow for multiple identical copies of objects, on the one hand the first characterization breaks down and there are unstable mechanisms satisfying property combination (i) with population-monotonicity. On the other hand, the property combination (ii) with resource-monotonicity characterizes (the most general) class of DA-mechanisms based on objects' fixed choice functions that are acceptant, monotonic, substitutable, and consistent. These choice functions are used by objects to reject agents in the agent-proposing deferred-acceptance-algorithm. Therefore, in the general model resource-monotonicity is the ''stronger" comparative statics requirement because it characterizes (together with our basic requirements and strategy-proofness) choice-based DA-mechanisms whereas population-monotonicity (together with our basic properties and strategy-proofness) does not.

- **Tumennasan N. (Aarhus University)**
Dynamic Matching Markets and the Deferred Acceptance Mechanism

Many matching markets are dynamic, with one side's priorities often depending on previous allocations. This creates opportunities for manipulations that do not exist in static matching problems. The school-choice problem, for example, exhibits dynamic features: students move considerably across schools and incumbent students and their siblings are often given the highest priorities. In such a dynamic environment, parents can manipulate the period-wise deferred acceptance (DA) mechanism which has been widely implemented. We analyze the severity of these strategic incentives in dynamic markets. We prove that under a suitable restriction on the schools' priorities, the fraction of agents with an incentive to manipulate the mechanism approaches zero as the market size increases. We also show that this restriction is tight; without it, the mechanism remains manipulable even in large markets. Finally, despite the significant computational complexity inherent in checking each possible strategy for a given player, we provide an algorithm with which to calculate the percentage of markets that can be successfully manipulated. Based on randomly generated data, we find this number to be very low: For markets with 100 schools, this percentage is only 1.58% when each school is endowed with a unit capacity; it drops to 0.04% when the capacity is twenty students per school. Our theoretical results together with our simulations, justify the implementation of the DA mechanism on a period-by-period basis in dynamic markets, and provide further support for its wide use in practice.

Information

- **Brandts J. (Barcelona Graduate School of Economics)**
Supply Function Competition, Market Power, And the Winner's Curse: A Laboratory Study

We design an experiment to understand whether informational frictions can lead to market power, in a context of supply function competition with private information. The symmetric fully rational Bayesian Nash equilibrium predicts that positively correlated costs lead to steeper supply functions and less competitive market outcomes than when costs are uncorrelated. We find evidence of those testable predictions which are common in both treatments, and we also confirm that behavior in the uncorrelated values treatment is close to the theoretical prediction. Furthermore, our data shows that differences in behavior and outcomes between treatments are substantially smaller than the theoretical model predicts. We find that at least 85% of the subjects in the positively correlated values treatment ignore the correlation amongst costs and bid as if costs were uncorrelated, which is consistent with the winner's curse. We provide a deeper behavioral explanation of our results by fitting the level-k model of strategic thinking and by conducting a best response analysis.

- **Ngangoué K. (DIW Berlin)**
Learning From Unrealized Versus Realized Prices

Our market experiment investigates the extent to which traders learn from the price, in situations where orders are submitted before or after the price has realized. When market participants have to submit their bids conditional on the price, they react only to their private information and not to the price. In a sequential trading mechanism, where the price is known at the time of bid submission, bids react to price to an extent that is roughly consistent with the benchmark theory.

- **Geiger M. (University of Innsbruck)**
Coordination Risk, Correlated Fundamental States, and Government Bond Yields in Currency Unions

The development of government bond yields in the Eurozone indicates that the default risk of member countries exhibit interdependencies due to the common currency. Our theoretical framework allows to study

the contagious effects of information about one country onto another. The decision of agents to invest in government bonds is modeled as a two-dimensional global game with correlated fundamental states. Using our model we can compute default probabilities and thus, the price of debt. In numerical experiments, we study the effects of the correlation of fundamental states and uncertainty about the fundamental state on the default probability. We find that information about one asset affects the price of the other asset only under certain circumstances and that contagious effects of uncertainty about one asset are potentially sizeable, albeit not unambiguous. Depending on the parameterizations, an increase of uncertainty about one asset may even decrease the default probability of the other asset.

Mechanism Design 1 (Organized By Weymark J. & Sen A.)

- **Hinnosaar T. (Collegio Carlo Alberto)**
Overbooking

We consider optimal pricing policies for airlines when passengers are uncertain at the time of ticketing of their eventual willingness to pay for air travel. Auctions at the time of departure efficiently allocate space and a profit maximizing airline can capitalize on these gains by overbooking flights and repurchasing excess tickets from those passengers whose realized value is low. Nevertheless profit maximization entails distortions away from the efficient allocation. Under standard regularity conditions we show that the optimal mechanism can be implemented by a modified double auction. In order to encourage early booking, passengers who purchase late are disadvantaged. In order to capture the information rents of passengers with high expected values, ticket repurchases at the time of departure are at a subsidized price, sometimes leading to unused capacity.

- **Johnen J. (European School of Management and Technology)**
Congestion Pricing: A Mechanism Design Approach

We apply a mechanism design approach to the problem of congestion pricing. In particular, we study the allocation of a set of drivers among two roads, one of which may be congested. Each driver is privately informed about her value of time and asked to report that value to the mechanism designer. This obviates the need for extensive econometric studies to determine the value of time in the population as required for Pigouvian taxation, the usual approach to addressing congestion problems. With a finite number of drivers, the efficient level of traffic on the congested road is ex ante uncertain. The efficient allocation is implementable by a price schedule in which whenever the report of a driver leads to the displacement of other drivers from the congested road to the slow road there is an increment in the price paid by the driver. As the travel time on the congested road decreases due to fewer drivers traveling on that road, drivers continuing to use that road pay higher transfers. As the number of drivers becomes large, a single price for use of the congested road becomes efficient, as in the standard Pigouvian approach to externalities.

- **Messner M. (Bocconi University, IGIER and CESifo)**
Selling to the Mean and the Variance

We consider the sale of a single good by an ambiguity averse seller to a privately informed buyer. The seller is a maxmin expected utility maximizer. His information about the agent's valuation is very poor and limited to partial knowledge of the mean and the dispersion of the buyer's type distribution. We characterize the optimal mechanism in dependence of the seller's information. We show that the seller optimally commits to a randomization over posted prices. The result implies that the long standing laws which require sellers to post deterministic prices might be to their detriment.

- **Paulsen P. (Technical University of Munich)**
First-Price Package Auctions in a Principal-Agent Environment

We analyze multi-object markets where bidders are firms and there is a principal-agent relationship within the firm with the bidding team as the agent. The agent wants to win the most valuable package but does not take

payments into account in his utility function. However, his bids are constrained by an allowance set by his principal. We will first derive equilibrium strategies of agents in first-price sealed-bid package auctions with two units and two bidders. For this, we investigate markets where bidders have overall allowances for one and two units, and use the results to rationalize markets where bidders get different budgets for the two packages. Interestingly, not bidding on a single unit is the unique and non-truthful ex post equilibrium for the agent when facing an overall allowance. The principal can enforce bidding on one unit only by the use of a distinct allowance for one unit that exceeds the allowance for two units.

Parallel Sessions July 2 (14.00-16.00)

Auctions 2

- **Boudreau J.W. (University of Texas-Pan American, Department of Economics and Finance)**
A Note on Noisy Vs. Standard All-Pay Auctions

We show that an all-pay auction with noise is in several important respects equivalent to a standard all-pay auction with complete information. Specifically, when noise is distributed uniformly and there are two bidders, equilibria in both formats feature the same expected levels of spending and rent dissipation. With more than two bidders the same holds for some equilibria but not all, as the noisy version can possess equilibria that feature lower spending and dissipation due to stronger bidders abstaining. Other features common to the standard all-pay auction, such as the exclusion principle, preemption effect, and the effect of spending caps, are present in the noisy version as well.

- **Carlson J.I. (Lund University)**
An Approximative Auction for When Bidders Have Non-Quasi-Linear Preferences

This paper presents an auction procedure which is of particular interest when short execution times are of importance. The basis is a procedure for approximating the bidders' preferences over two types of items when complementarity between the two may exist. In particular, linear approximations of the bidders' indifference curves are made. The resulting approximated preference relation is shown to be complete and transitive at any given price vector. It is shown that an approximated Walrasian equilibrium always exists if the approximated preferences of the bidders comply with the gross substitutes condition. Said condition also ensures that the set of approximated equilibrium prices forms a complete lattice. A process is proposed which is shown to always reach the smallest approximated Walrasian price vector.

- **Fugger N. (University of Cologne)**
Trust in Procurement Interactions

We investigate the claim that auctions in procurement are detrimental to the buyer-seller relationship, which is expressed by less trust by the buyer and more opportunistic behavior by the supplier after the sourcing. To do so, we compare experimentally a standard auction and a buyer-determined auction. It turns out that buyer-determined auctions result in higher prices but enable cooperation between the buyer and the selected supplier. In the buyer-determined auction it can be optimal for the buyer to choose the larger offer. The standard auctions, on the other hand, yield lower prices but reduce cooperation to a minimum. Interestingly the degree of trust reflected by a larger number of trades and efficiency in case of trade are significantly higher in the buyer-determined auction. Theoretical reasoning based on other-regarding preferences helps to organize the results.

- **Gillen P. (University of Cologne)**
Pre-Auction or Post-Auction Qualification?

We compare auctions with bidder qualification before or after the bidding process. We show that although post-auction qualification is more efficient, an auctioneer prefers pre-auction qualification if bidders' qualification costs are high.

Bargaining

- **Karagözoğlu E. (Bilkent University)**

Between Anchors and Aspirations: A (New) Family of Bargaining Solutions

Most cooperative bargaining models explicitly or implicitly assume that two major factors influence the negotiated settlements: anchors and aspirations. Accordingly, they employ anchor points such as the disagreement point or the reference point and aspiration points such as the ideal (or utopia) point or the tempered aspirations point. Nevertheless, the choice of a particular salient point over an alternative is usually left unexplained.

We introduce two parameters into (cooperative) bargaining problems with a reference point. The first parameter can be interpreted as the power (or the salience) of the reference point in determining the anchor, whereas the second parameter can be interpreted as its power in shaping agents' aspirations. Using these parameters, we obtain a new family of bargaining solutions with Kalai-Smorodinsky (Kalai and Smorodinsky, 1975), Gupta-Livne (Gupta and Livne, 1988), tempered aspirations (Balakrishnan, G_omez, and Vohra, 2011), and local Kalai-Smorodinsky (Gupta and Livne, 1989) solutions as special cases.

We offer multiple characterizations for both the individual members of this family and the whole family in bilateral bargaining problems. Finally, we argue that our model can be used to shed light on some experimental findings on simple bargaining games and to further develop bargaining models.

- **Lang X. (Tilburg University)**

On the Impossibility of Non-Constant Divisions in Bargaining with Correlated Types

We consider a bargaining situation where two agents have correlated beliefs on their disagreement payoffs but the gains from trade are commonly known. We investigate the (im)possibility for any ex post effcient, individually rational, incentive compatible and ex post budget balanced mechanism to be utility monotonic: each agent's interim (or ex post) utility from the mechanism is non-constant and weakly monotone in his disagreement payoff. We find that if the mechanism is dominant strategy incentive compatible, or ex post weakly monotone, or continuous and interim weakly monotone, then it must be random dictatorship. We characterize a class of discontinuous Bayesian mechanisms and identify necessary conditions for non-constant utility outcomes. Finally, by introducing ex ante budget balance, we construct dominant strategy mechanisms with (almost) full extraction of surplus to obtain a possibility result.

- **Hwang I. (University of Miami)**

Transparency of Outside Options in Bargaining

This paper studies the effects of the transparency of an outside option in bilateral bargaining. A seller posts prices to screen a buyer over time, and the buyer may receive an outside option at a random time. We consider two information regimes, one in which the arrival of the outside option is public and one in which the arrival is private. The public arrival of the outside option works as a commitment device that forces the buyer to opt out immediately. The Coase conjecture holds in the unique equilibrium. In contrast, private information about the outside option leads to additional delay and multiplicity. The Coase conjecture fails in some equilibria. The buyer's preference about transparency is time-inconsistent: Ex ante, she prefers public arrivals, but ex post she prefers not to disclose her outside option if it is private.

- **Eraslan H. (Rice University)**

Coalitional Bargaining

We study a model of sequential bargaining in which, in each period before an agreement is reached, the proposer's identity is randomly determined, the proposer suggests a division of a pie of size one, each other agent either approves or rejects the proposal, and the proposal is implemented if the number of approving agents exceeds a threshold, and the agents have concave utilities. We show that the stationary equilibrium expected payoffs of this bargaining game are unique.

Aggregation and Welfare

- **Østerdal L.P. (University of Southern Denmark)**

First Order Dominance: Characterization and Two Checking Algorithms for the Bivariate Case

How to determine if a distribution is superior to - i.e. first order dominates - another is a fundamental problem with many applications in economics, finance, probability theory and statistics. Nevertheless, little is known about how to efficiently check first order dominance in two or more dimensions. We develop a new characterization of first order dominance and provide two fast dominance checking algorithms for the bivariate case. The first runs in quadratic time in the number of outcomes and constructs a sequence of probability mass transfers from better to worse outcomes leading from one distribution to another whenever such a sequence exists. The second runs in linear time in the number of outcomes and is very easy to implement.

- **Herzberg F. (Bielefeld University)**

Respect for Experts or Respect for Unanimity? The Liberal Paradox in Probabilistic Opinion Pooling

Amartya Sen (1970) has shown that three natural desiderata for social choice rules are inconsistent: universal domain, respect for unanimity, and respect for some minimal rights — which can be interpreted as either expert rights or liberal rights. Dietrich and List (2008) have generalised this result to the setting of binary judgement aggregation. This paper proves that the liberal paradox holds even in the framework of probabilistic opinion pooling and discusses options to circumvent this impossibility result: restricting the aggregator domain to profiles with no potential for conflicting rights, or considering agendas whose issues are not all mutually interdependent.

- **Schoch D. (Nottingham University)**

Game Form Representation for Judgement and Arrovian Aggregation

Judgement aggregation theory provides us by a dilemma since it is plagued by impossibility results. For a certain class of logically interlinked agendas, full independence for all issues leads to Arrovian dictatorship. Since independence restricts the possibility of strategic voting, it is nevertheless a desirable property even if only partially fulfilled.

We explore a "Goldilock" zone of issue-wise sequential aggregation rules which offers just enough independence not to constrain the winning coalitions among different issues, but restrict the possibilities of strategic manipulation. Perfect Independence, as we call the associated axiom, characterises a game-form like representation of the aggregation function by a binary tree, where each non-terminal node is associated with an issue on which all voters make simultaneous decisions.

Our result is universal insofar as any aggregation rule satisfying independence for sufficiently many issues has a game-form representation. One corollary of the game form representation theorem implies that dictatorial aggregation rules have game-form representations, which can be "democratised" by simply altering the winning coalitions at every node.

- **Zwicker W. (Union College)**

Aggregation of Binary Evaluations: A Borda-like Approach

We characterize a rule for aggregating binary evaluations – equivalently, dichotomous weak orders – similar in spirit to the Borda rule from the preference aggregation literature. The binary evaluation framework was introduced as a general approach to aggregation by Wilson (J. Econ. Theory 10 (1975) 63-77). In this setting we characterize the "mean rule," which we derive from properties similar to those Young (J. Econ. Theory 9 (1974) 43-52) used in his characterization of the Borda rule. Complementing our axiomatic approach is a derivation of the mean rule using vector decomposition methods that have their origins in Zwicker (Math. Soc. Sci. 22 (1991) 187-227). Finally, we derive the mean rule from an approach to judgment aggregation recently proposed by Dietrich (Soc. Choice. Welf. 42 (2014) 873-911).

Mechanism Design 2

- **Quadir A. (Osaka University)**
Mechanism Design in Single Dimensional Type Spaces

We consider a class of mechanism design problems in private value environment where the type of an agent is a single number. The preference over transfers is quasi-linear for every agent. We give a complete characterization of dominant strategy incentive compatible mechanisms for these problems. Further, by imposing a suitable version of anonymity and non-bossiness along with dominant strategy incentive compatibility, we characterize the Groves mechanisms.

- **Krämer F. (LMU Munich)**
Delegating Pricing Power to Buyers: An Experimental Investigation

We conduct an experiment to study market outcomes when pricing power is fully or partly delegated to buyers. Customer-driven pricing mechanisms such as Pay What You Want and Name Your Own Price are frequently used to increase market penetration, segment and enlarge markets as well as to achieve endogenous price discrimination. This study examines the viability of these two mechanisms both in isolated and competitive settings, contributing to a better understanding of the feasibility of price delegation as a marketing device. We find that both mechanisms are effective in achieving endogenous price discrimination, while PWYW is better suited to reach a wide range of customers. In terms of profits, however, NYOP is superior to PWYW in monopolistic and duopolistic settings. Furthermore, we provide insights into the determinants of buyer and seller behavior under both pricing formats, showing that PWYW appeals to social preferences and NYOP to risk attitudes.

- **Juarez R. (University of Hawaii)**
Implementing Efficient Allocations in Bilateral Networks

Agents are endowed with time that is invested in different bilateral projects. Projects generate profit depending on their time allocation. A mechanism divides the profit generated by the projects among agents. We study mechanisms that incentivize agents to contribute their time to the level that generates the maximal profit for society at the Nash equilibrium (we call this efficiency). We focus on the case of bilateral projects that is when every project requires time allocation from only two agents. Our main result is the characterization of all the mechanisms that satisfy efficiency for any set of production functions. Furthermore, we characterize efficient mechanisms that satisfy other desirable properties such as monotonicity in the payoffs, strong Nash equilibrium of the efficient outcome, or additivity in the number of participating agents.

- **Sharma T. (ITAM)**
Money- Back Guarantees

We provide a framework to evaluate whether or not a seller can increase his revenue in interacting with a privately informed buyer by using money-back guarantees (MBGs). The buyer's value for the good exhibits fit risk and his type is multidimensional giving the probability of fit as well as the value in case of fit. The seller has the option to offer a MBG together with the good. We reformulate the optimal mechanism design problem and show that typically the optimal mechanism contains MBGs. Furthermore choosing the optimal mechanism is tantamount to choosing two prices: (i) a discount price at which no MBG is offered and (ii) a regular (higher) price which comes with a MBG. We also analyze two limit scenarios where private information is one-dimensional. If the seller knows the probability of fit but not its value, then MBGs are not useful. If, on the other hand, the value of it is commonly known but its probability is buyer's private information, then MBGs can be used to extract full surplus from the buyer.

Behavioral Game Theory

- **Neugebauer T. (University of Luxembourg)**

Taming Selten´s Horse by Impulse Matching

We experimentally test the prediction of the perfect equilibrium concept in the three-player game Selten's Horse (Selten 1975). At first sight, our data show little support of the perfect equilibrium and rather favor the intuitively unreasonable equilibrium. The observed dynamics of the game, however, are in line with learning direction theory whose impulse matching dynamics converge on the perfect equilibrium. We tentatively conclude that the observed dynamics are in line with a convergence on the perfect equilibrium, but convergence takes time.

- **Smith J. (Rutgers University)**

Cognitive load and mixed strategies

We study the relationship between the cognitive load manipulation and strategic sophistication. The cognitive load manipulation is designed to reduce the subject's cognitive resources that are available for deliberation on a choice. In our experiment, subjects are placed under a high cognitive load (given a di¢ cult number to remember) or a low cognitive load (given a number that is not di¢ cult to remember). Subsequently, the subjects play a one-shot game then they are asked to recall the number. This procedure is repeated for various games. We find a nuanced and non-monotonic relationship between cognitive load and strategic sophistication. This relationship is consistent with two effects. First, subjects under a high cognitive load tend to exhibit behavior consistent with the reduced ability to compute the optimal decision. Second, the cognitive load tends to affect the subject's perception of their relative standing in the distribution of the available cognitive resources and this prompts additional cognitive effort. The net result of these two opposing effects depends on the strategic setting. Our experiment provides evidence on the literature that examines the relationship between measures of cognitive ability and strategic sophistication.

- **Nagel R. (ICREA & Pomepu Fabra University & BGSE)**

De-framing Rules to De-anchor Beliefs in Beauty Contest Experiments: Keynesian Level–k vs. Keynesian Sentiments

In the original modern Beauty Contest game a player has to choose a number between zero and 100 with the objective to be closest to 2/3 times the average with a fixed prize payment. Zero is the unique rationalizable equilibrium. Behavior, however, is very heterogeneous since many subjects wrongly anchor their choices (described by a level k model). This game provides an important element in macroeconomic models which are frequently used for making policy decisions, e.g. the new Keynesian model, neo classical models, global game related models etc. Thus, the policy maker has to be concerned about whether actual behavior is in equilibrium or whether there is some convergence to equilibrium. This is because policies that give good results in equilibrium, they may not work so well, for example, if people act like level-k players.
We provide a new model with two substantial changes of the game, one which we believe reflects better what happens in reality: one is that each player receives an idiosyncratic signal drawn from a normal distribution about the key variable to predict; the other is that the action is not restricted to a bounded interval. The aggregate theoretical prediction does not change with this new game, but we show that laboratory experimental behavior is in closer agreement with the theory, even in less sophisticated subject pools, whose behavior in this game is similar to the one of sophisticated groups, such as economic professors, in the traditional game. We also provide comparisons of the total surplus achieved in this game with respect to what happens in the traditional one.

- **Meloso D. (Rennes School of Business)**
The Mechanics of Reputational Cheap Talk: An Experiment with Crystal Balls

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. We anatomically dissect the reporter's strategic behavior through a number of treatments that control for the beliefs of, as well as learning by, the evaluator. We find evidence for reporters to best reply to fixed beliefs by the evaluator. When controlling for learning by evaluators, behavior is 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 lying more than predicted by baseline equilibrium theory.

Group Identification

- **Cağlayan D. (İstanbul Bilgi University)**
In-Group Favoritism vs. Social Efficiency Concerns

This study is an attempt to experimentally investigate whether in-group favoritism dominates social efficiency concerns. In a small society composed of 'minimal groups', a decision maker is given two options to increase his payoff through reallocating a part of others' endowments: he can transfer either a part of each in-group member's endowments to himself or a part of each out-group member's endowments to himself and his in-group members. The sunk cost associated with the reallocation of each endowment is equal in both reallocation options, however, the social inefficiency caused by the latter is significantly more than the one caused by the former although both options implement exactly the same of amount of increase in the decision maker's payoff. The same design is adopted in the control treatment except that there are no groups to which the agents are assigned and the above reallocation options are implemented by transferring endowments of randomly chosen subjects. Our results indicate that in-group favoritism dominates social efficiency concerns. The ratio of subjects who prefer not to reallocate any endowments in the main treatment is very close to the one in the control treatment. However, the choices regarding the reallocation options differ significantly between the two treatments.

- **Tapkı G.İ. (Kadir Has University)**
Two Simple Characterizations of the Liberal Rule Based On Consistency Requirement

We study group identification or qualification problem introduced by Kasher and Rubinstein (1997). Earlier literature mainly focuses on axiomatic analysis of this model and have several characterizations of Liberal rule. In this paper, we introduce two consistency requirements for this model. Both of them require that after a decision is made about a group of people, if some people accept the decision made about them and leave, then if we make a new decision for the remaining people, it should be the same as before. We propose two new characterizations of the Liberal rule based on these consistency requirements.

- **Krupka E. (University of Michigan)**
Mirror on the Network: Peer Selection and Endogenous Preferences

We use a longitudinal design, in which we follow participants through their first academic year at the university, to test and distinguish between selection based on preferences and a dynamic process of preference formation. We recruit incoming freshman to participate in three waves of an online experiment where we elicit subjects' social network using an incentive compatible mechanism and then measure subjects' levels of altruism, willingness to take risks, and willingness to delay rewards (using common experimental protocols). Using this data we identify whether an individual's generosity, risk preferences and impatience are (a) influenced by the preferences of others in their social network, and/or (b) influential in changes to their social network over time. We find that subjects' risk and time preferences are significantly positively correlated with the preferences of their friends. Additionally, we find that changes in subjects´ social networks are

significantly influenced by social preferences. Subjects are more likely to add someone as a friend, and less likely to drop as a friend, the more similar their social preferences are.

- **Ju B.G. (Seoul National University)**
Multinary Group Identification

We study the problem of determining membership for groups based on individual opinions (known as group identification problems). The one-vote rules are defined and characterized in the binary and multinary models (Miller, 2008; Cho and Ju, 2014). However, because the two results are obtained in different models and involve different axioms, it is difficult to compare them properly. We propose an extended model of group identification that subsumes both the binary and multinary models. Using the extended setup, we show that the axioms that characterize the one-vote rules in the multinary setup characterize a family of rules that contains the one-vote rules in the binary setup as a special case. We also find that in the binary setup, an independence axiom is implicitly assumed, playing a more important role than consistency, and that a weaker set of axioms suffices for Miller's (2008) characterization.

Computational and Experimental Decision Making (Organized By Haake C.J.)

- **Epp, L. (University of Paderborn)**
Consecutive moral decision-making: evidence from an economic experiment

In online markets customers have to rely on the market's reputation system to assess the quality of products and services. However, due to anonymity in online markets sellers have incentives to deliver low quality even if their reputation profile is high. In those situations, moral costs might compensate the monetary benefit of opportunistic behaviour and thus create an internal conflict. In the present paper we analyse how self-deception lowers moral costs. We focus on moral balancing as a special form of self-deception in consecutive decision-making situations which assumes that individuals can behave immorally as long as the associated moral costs do not lead the individual to drop below the personal convenient level of self-worth. In our experiment, subjects can raise their self-worth by donating parts of their earnings from a real effort task to doctors without borders. After that decision, subjects are then faced with a consecutive decision whether to sign with a handprint a petition against child soldiers. Contrary to psychological research about moral balancing we do not find evidence that subjects who firstly behave morally good by donating feel licensed to decide selfishly in the second decision. Particularly in the treatment with high monetary incentives the great majority acts consistently by either deciding in favour or against both altruistic options. Further, donating subjects behave morally consistent in line with personality attributes such as self-worth and ethical awareness elicited with a questionnaire after the experiment.

- **Cord-Landwehr A. (University of Paderborn)**
Network Creation Games: Think Global -Act Local

We investigate a non-cooperative game-theoretic model for the formation of communication networks by selfish agents. Each agent aims for a central position at minimum cost for creating edges. In particular, the general model (Fabrikant et al., PODC'03) became popular for studying the structure of the Internet or social networks. Despite its significance, locality in this game was first studied only recently (Bilo et al., SPAA'14), where a worst case locality model was presented, which came with a high efficiency loss in terms of quality of equilibria. Our main contribution is a new and more optimistic view on locality: agents are limited in their knowledge and actions to their local view ranges, but can probe different strategies and finally choose the best. We study the influence of our locality notion on the hardness of computing best responses, convergence to equilibria, and quality of equilibria. Moreover, we compare the strength of local versus non-local strategy-changes. Our results address the gap between the original model and the worst case locality variant. On the

bright side, our efficiency results are in line with observations from the original model, yet we have a non-constant lower bound on the price of anarchy.

- **Drees M. (University of Paderborn)**
Approximate Pure Nash Equilibria in Bandwidth Allocation Games

In bandwidth allocation games (BAGs), the strategy of a player is a vector of weights on resources. Her utility is at most the sum of these weights, provided they are fully satisfied. Every resource has a limited capacity and if the total weight on the resource exceeds this capacity, it has to be split between the players. Since these games generally do not have pure Nash equilibria, we consider approximate pure Nash equilibria, in which no player can improve her utility by more than some fixed factor _ through unilateral strategy changes. We give both upper and lower bounds for the existence of these equilibria and study the computational complexity of the decision problem. We further give a tight bound on the approximate price of anarchy. Finally, we prove that a certain class of utility-maximization games (which includes BAGs) converges quickly towards socially good states.

- **Skopalik A. (University of Paderborn)**
Approximate Pure Nash Equilibria in Weighted Congestion Games

We study the existence of approximate pure Nash equilibria in weighted congestion games. We develop techniques to obtain approximate potential functions that prove the existence of α-approximate pure Nash equilibria and the convergence of α-improvement steps. We show how to obtain upper bounds for approximation factor α for a given class of cost functions.
We demonstrate our techniques and establish the existence of approximate equilibria for specific classes of cost functions. For example for concave cost functions the factor is at most 3=2, for quadratic cost functions 4=3, and for polynomial cost functions of maximal degree d it is at most $d + 1$. For games with two players we obtain tight bounds which are as small as for example 1:054 in the case of quadratic cost functions.

Parallel Sessions July 2 (16.30 -18.00)

Implementation

- **Azacis H. (Cardiff University)**
Repeated Implementation

We consider the setup investigated in Lee and Sabourian (2011) and in Mezzetti and Renou (2012). We provide a sufficient and necessary condition using a version of dynamic monotonicity (introduced in Mezzetti and Renou (2012)) which characterizes the social choice functions which are repeatedly Nash implementable using deterministic stage mechanisms but possibly stochastic regimes given that the number of players is at least 3. It turns out that additionally allowing for stochastic stage mechanisms simplifies the characterization: a version of Maskin monotonicity which is a necessary condition for repeated implementation is also a sufficient condition for repeated Nash implementation among the social choice functions, which are efficient in the range.

- **Dalkıran A. (Bilkent University)**
Epsilon-Ex Post Implementation

We provide necessary and sufficient conditions for epsilon-ex post implementation. Our analysis extends Bergemann and Morris (2008) to allow for epsilon-bounded rationality. Yet our necessity condition, epsilon-ex post monotonicity, and Bergemann and Morris's (2008) necessity condition, ex post monotonicity, are not nested. Epsilon-expost implementation adds another dimension of robustness to ex post implementation in terms of bounded rationality.

- **Lopez H. (University of Maryland)**
Practical Implementation of a Traffic Congestion System

This paper studies traffic congestion abatement as a practical implementation problem. In theory, a social planner can ensure efficient behavior by setting the price faced by decision makers to be equal to the social marginal cost. In practice, however, policy makers lack the information to set such a price. This paper develops a decentralized and anonymous dynamic system that allows agents to achieve the optimal level of traffic without knowledge of demand or social marginal cost. An experiment was used to test the effectiveness of the system. In the lab, the system achieved an efficiency of 95%.

Auctions 3

- **Bobkova N. (University of Bonn)**
First Price Auction with Asymmetrically Budget Constrained Bidders

I analyze the first price auction for bidders with asymmetrically distributed budgets and a common valuation for the object. For identically and independently distributed budgets, Che and Gale (1996) derive the symmetric equilibrium bidding strategies for the first price auction. I extend their framework for asymmetrically distributed budgets and fully characterize the set of equilibria for this class of auctions. There exists a threshold for the reverse hazard rates of budget distributions, above which the degree of asymmetry in the budgets has no influence on the equilibrium strategies: bidding the entire budget is the unique equilibrium strategy. However, if at least one reverse hazard rate undercuts this threshold, mass points in the equilibrium strategies arise. I derive pure strategy weakly monotonic bidding functions and show, that under mild regularity conditions, the weaker bidder bids more aggressively than his stronger opponent. Furthermore, I show that information disclosure about budget distributions for ex-ante symmetric bidders is never profitable for the auctioneer.

- **Boscan L. (Copenhagen Business School)**
The Reverse Product-Mix Auction and Further Extensions

In this paper I propose a reverse Product-Mix Auction, initially described by Klemperer (2010) as a forward auction. In my setting, bidders approximate supply functions and the auctioneer chooses demand functions of imperfectly substitutable and indivisible commodities. While this format is applicable to a wide range of settings, I am motivated by its potential application to the problem of power system exibility procurement. I extend this setup in two directions, namely, to the case in which there are finitely many goods traded (i.e., the N varieties case) and to a double auction format, in which many buyers and many sellers bid. While these extensions have been described in general terms by Klemperer (2010), and Baldwin and Klemperer (2012), the existing literature has not studied them in detail, solution techniques have not been sufficiently analyzed, nor applications (besides the Bank of England's repo operations) have been documented so far. With an emphasis on the computational issues behind its implementation, this paper aims at filling some of these gaps.

- **Di Corato L. (Uppsala University)**
Procurement Auctions for Conservation Contracts with Embedded Real Options

Public procurement contracts providing payments to landowners for protecting and enhancing environmental assets generally require long-term commitments. However, opportunity compliance costs higher-than-expected can lead to premature terminations of conservation agreements. We study how early-exit options can affect landowners. Bidding behavior in multidimensional auctions for conservation contracts when bidders do not face sufficiently strong disincentives against contract breach. First, it is shown that bidder's payoff is lower than when competing for contracts with enforceable durations. Secondly, that failure to account for the risk of opportunistic behavior can lead to contract awards that do not maximize the public agency's potential payoff. Finally, the paper provides recommendations for addressing this problem by pointing out the role of eligibility rules and competition.

Information and Voting

- **Bozbay İ. (University of Surrey)**
A Bayesian Voting Model with Multiple Issues

This paper analyses the problem of aggregating judgments over multiple issues. We consider a group of voters who share a common preference for reaching true collective judgments, but hold private information about what the truth might be. We extend previous models by introducing types from a continuous distribution, which represent private information. Assuming strategic voting in a Bayesian voting game setting, we determine the voting rules that lead to collective judgments that efficiently incorporate all private information.

- **Elbittar A. (Center for Research and Teaching in Economics (CIDE))**
Ignorance and Bias in Collective Decisions

We study theoretically and experimentally a committee with common interests. Committee members do not know which of two alternatives is the best, but each member can acquire privately a costly signal before casting a vote under either majority or unanimity rule. In the experiment, as predicted by Bayesian equilibrium, voters are more likely to acquire information under majority rule, and attempt to counter the bias in favor of one alternative under unanimity rule. As opposed to Bayesian equilibrium predictions, however, many committee members vote when uninformed. Moreover, uninformed voting is strongly associated with a lower propensity to acquire information. We show that an equilibrium model of subjective prior beliefs can account for both these phenomena, and provides a good overall fit to the observed patterns of behavior both in terms of rational ignorance and biases.

- **Xefteris D. (University of Cyprus)**
Imperfectly informed voters and Strategic Extremism

We analyze an electoral competition model with two office motivated candidates where a) one of the two candidates enjoys a non-policy advantage and b) voters use shortcuts (e.g. interest-group/media endorsements) to infer the policy platforms of the competing candidates. That is, voters have imperfect information about the candidates. policy proposals: they do not observe the exact policy proposals of the candidates but only which candidate o¤ers the most leftist/rightist platform. In the unique equilibrium of the game the behavior of the two candidates tends to maximum extremism, but it may converge or diverge depending on the size of the advantage. For small values of the advantage candidates converge to the extreme policy most preferred by the median and for large values of the advantage candidates strategies diverge: each candidate specializes in a different extreme policy. By introducing an increasing measure of informed voters the equilibrium strategies gradually become more moderate and in the limit we converge to the original perfect information model in which candidates locate close to the median voter. That is, an increasing number of voters who decide which candidate to support using shortcuts constitutes a strong centrifugal force in electoral competition driving candidates platforms towards the extremes.

Finance and Markets

- **Bosch-Doménech A. (Berlin University of Technology)**
Cognitive Bubbles

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.

- **Jain N. (City University London)**
Financing and Mode of Entry in Foreign Markets

We study the mode of entry decision of a multinational firm with and without financing constraints on the local firm. We find that the multinational's expected profits are a discontinuous function of its belief about demand in one mode of entry. These discontinuities are due to the endogeneity of reservation utilities as well as the interaction between an agency problem and a game. Financing constraints lead to an increase in the multinational's profits from joint venture, while its profits from foreign direct investment decrease if the probability of high demand is low but increase otherwise.

- **Rossini G. (University of Bologna)**
Vertical Flexibility, Outsourcing and the Financial Choices of the Firm

We investigate the relationship between the financial choices and the extent of vertical flexibility of a firm. By vertical flexibility we mean simply the opportunity to outsource a necessary input and to reverse the choice as input market conditions dictate. We consider a firm that has to select the shares of equity and debt and its vertical setting, i.e., whether and how much to outsource the production of a necessary input and how to finance all that. Debt is provided by a lender that requires the payment of a fixed coupon over time and, as a collateral, an option to buy out the firm in certain circumstances. Debt leads to the same level of flexibility acquired by an unlevered firm but to invest earlier in the flexible technology. An alternative to debt is the

involvement of venture capital for the production of the input. We explore this second avenue finding that the extent of outsourcing adopted is lower than for the unlevered firm, but the firm invests earlier in the flexible technology.

Political Economy 1

- **Cobo Reyes R. (University of Exeter Business School)**
The Effect of Charitable Giving On Workers' Performance: Experimental Evidence

We investigate how donating worker earnings for voluntary extra work, a form of corporate social responsibility, affects worker behavior. In our experiment, participants performed a real-effort task. Subjects were asked to enter real data (from an unrelated experiment) for 60 minutes and were paid on a piece-rate basis. After the 60 minutes, they were then asked if they wished to stay for up to another 30 minutes; we varied the piece-rate pay and whether it was paid to the worker or to a charity. Our results show that when the piece rate paid is relatively high, workers do more extra work when they are directly paid this piece rate as compared to when their earnings are instead paid to a charity. However, with low piece rates, this relationship reverses and workers are much more motivated when the money is donated to a charity instead of when it is paid directly to them. This approach is potentially a winwin outcome for at least firms and charities. We also find that when we only pay a small amount to workers, their behavior differs only modestly from the situation in which we do not pay at all.

- **Djawadi B. (University of Paderborn)**
Know your whistleblowers: What personality can tell you about who will blow the whistle-Insights from an economic experiment

The present paper suggests an innovative experimental design to study the nature and occurrence of fraud and whistleblowing in an employee-organization context. In particular, we aim at identifying whether individuals in the role of staff members are willing to act ethically by blowing the whistle on their manager's decision to withheld money that is destined for a charitable purpose. Since the sole act of reporting leads to negative financial consequences for both players, the decision to blow the whistle seems to be guided by ethical considerations that outweigh pure monetary interests. We collect data on 83 employee-manager pairings where 60 managers misappropriate funds determined for a charity. Of the 60 employees stuck in a corrupt relationship with their managers, 20 employees blow the whistle leading to negative financial consequences for both, the manager and themselves. A questionnaire at the end of the experiment reveals only small differences in the Big Five personality scales between fraudsters and non-fraudsters, as well as between whistleblowers and non-whistleblowers. However, fraudsters score significantly higher in their attitude towards risk and score significantly lower in altruism, integrity and non-rationalizations. Whistleblowers score significantly higher in the personality domains of sincerity, fairness, integrity, low incidence, non-rationalizations and caution.

- **Leventoğlu B. (Duke University)**
Born Weak, Growing Strong: The Life Cycle of Rebel Organizations and Civil Wars Duration

All rebel organizations start weak. Even though this is a very obvious and logical statement, the literature on civil war has not integrated this truism theoretically. We present a model that allows for the fact that all rebels start weak and seek to build their bargaining power during fighting, which explains the variation fighting durations and their outcomes. We find empirical support for the idea that low income individuals that initially fight the government (rebel organizations) have to convince high income individuals to turn out against the government to gain government concessions. Empirically, we measure government concessions as peace agreements that provide strong provisions for rebel organization.

Oligopolistic Games

- **Wiseman T. (University of Texas at Austin)**
When does predation dominate collusion?

I study repeated Bertrand competition among oligopolists. The only novelty is that firms may go bankrupt and permanently exit: the probability that a firm survives a price war depends on its financial strength, which varies stochastically over time. In that setting, an anti-folk theorem holds: when firms are patient, every Nash equilibrium involves an immediate price war that lasts until only a single firm remains. Surprisingly, the possibility of entry may facilitate collusion, as may impatience. The model can explain observed patterns of collusion and predation, including recurring price wars and asymmetric market sharing.

- **Georgantzis N. (University of Reading)**
Equilibrium in Catalogue Competition: Theory and Experimental Evidence

This paper studies a catalogue competition game: two competing firms decide at the same time product characteristics and prices in order to maximize profits. Since Dasgupta and Maskin (1986) it is known that this one-shot Hotelling game admits an equilibrium in mixed strategies but nothing is known about its nature. We consider a discrete space of available product characteristics (a discrete subset of the unit interval) and continuous pricing and we fully characterize the unique symmetric equilibrium of the catalogue competition game for any possible degree of risk aversion of the competing firms. We experimentally test the predictions of the model and confirm the role of risk attitudes on the observed pricing and location decisions.

- **Haake C.J. (University of Paderborn)**
Strategic Formation of Customer relationship Networks

We analyze the stability of networks when two intermediaries strategically form costly links to customers. We interpret these links as customer relationships that enable trade to sell a product. Equilibrium prices and equilibrium quantities on the output as well as on the input market are determined endogenously for a given network of customer relationships. We investigate in how far the substitutability of the intermediaries' products and the costs of link formation influence the intermediaries' equilibrium profits and, thus, have an impact on the incentives to strategically form relationships to customers. For networks with three customers we characterize locally stable networks, in particular existence is guaranteed for any degree of substitutability. Morover for the special cases of perfect complements, independent products and perfect substitutes local stabllity coincides with the stronger concept of Nash stability. Additionally, for networks with n customers we analyze stability regions for selected networks and determine their limits when n goes to infinity. It turns out that the shape of the stability regions for those networks does not significantly change compared to a setting with relatively small number of customers.

Matching 2 (Organized By Kesten O.)

- **Gitmez A.A. (MIT)**
Student Exchange with Partial Fairness

We extend the idea of consent in school choice literature, first introduced by Kesten [2010], by characterizing the set of constrained efficient outcomes for a school choice problem with student consent. We introduce a class of algorithms, denoted Student Exchange with Partial Fairness (SEPF), which guarantees to find a constrained efficient matching for any problem. Moreover, any constrained efficient matching is reachable via an algorithm within the class of SEPF. We identify the unique rule within SEPF which satisfies a basic incentive-compatibility axiom, consentproofness, and demonstrate that it is equivalent to Kesten [2010]'s EADAM

(Efficiency Adjusted Deferred Acceptance Mechanism) algorithm, thus justifying the seemingly ad hoc construction of EADAM. Our results are easily applicable to settings where the centralization of assignments to public and private schools is possible.

- **Phan W. (University of Rochester)**
Efficiency, Strategy-Proofness, and the Partial-Endowment Lower Bound in the Object Re-Allocation Problem

Abstract not available

- **Kesten O. (Carnegie Mellon University)**
Curse of Stability: The Appeals round of the NYC High School Match

We study the appeals process in New York City high school match. In the current procedure, all students are first assigned to the schools via Deferred Acceptance (DA) mechanism. The students who are unsatisfied with the outcome of the DA mechanism reapply to be re-assigned to a better school via the Top Trading Cycles (TTC) mechanism in the appeals round. Although both DA and TTC mechanisms are strategy-proof, the current procedure gives incentive to students to be strategic in their choices. In particular, a student may misreport his preferences over schools in order to be assigned to a school that he can trade with a better school in the appeals round. We show that, if all students do not participate in the appeals round then it is impossible to eliminate gaming by using a stable mechanism in the first round and individually rational, non-wasteful mechanism in the appeals (second) round. When all students participate in the appeals round, students still have incentive to act strategically if a stable mechanism is followed by a Pareto efficient and individually rational one. To overcome the strategic issues that arise we propose two alternatives. Applying DA mechanism in both rounds eliminates the gaming as long as all students are considered in the appeals round. On the other hand, applying TTC in the first round and any individually rational and strategy-proof mechanism in the appeals (second) round eliminates the gaming even if only a subset of students are considered in the second round.

Parallel Sessions July 3 (9.00 -11.00)

Transferable Utility Games

- **Derya A. (Bilkent University)**
A Characterization of the Myerson Value

We provide a characterization of the Myerson value with two axioms. Our first axiom considers a situation where there is an increase (or decrease) of the value function at a network g and at each network containing g. It requires that at such a situation, this increase (or decrease) must be divided equally between all the players in g that has at least one link at g. Our second axiom is a condition on the value function where the value of each network is zero. It requires that if the value is zero at any of the networks, then each player must get zero payoff at each network. By changing our first axiom slightly, we also give a characterization for the position value. Our characterizations are similar to Chun's characterization of the Shapley value. We compare our results with Chun's result.

- **Doğan E. (HSE Moscow)**
An Egalitarian Solution to Minimum Cost Spanning Tree Problems

We introduce a new core selection to minimum cost spanning tree problems that is easy to calculate, continuous, cost and population monotonic meeting ranking. We prove that it Lorenz dominates every other allocation in the irreducible core of the problem. As a corollary, it Lorenz dominates the celebrated folk solution whenever these solutions yield different outcomes.

- **Koray S. (Bilkent University)**
Every Member of the Core is as Respectful as Any Other

Given any member w of the core of a convex transferable utility (TU) game G, can one specify a richer structure consistent with G, which will single out w as the only cooperative outcome in the sense that no coalition can improve upon w? That is the question this paper deals with. A natural candidate for such a richer structure is a strategic form game that induces the given TU game under the maxmin operator, which also renders the α-core as the spiritual counterpart of the core in a strategic environment. However, the α-core as defined by Aumann (1961) assumes nontransferability of utility. Here we define γ-semitransferability of utility in strategic form as well as cooperative games for each γ in the unit interval, where γ=0 corresponds to nontransferabiliy and γ=1 to full transferability. The α-core of each strategic form game under full transferability of utility leads to a finite number of allocations, each of which belongs to the core of the TU game induced under the maxmin operator. Conversely, we also construct a canonical family of strategic form games such that, for each core allocation w of each TU game G, there is a preimage of G in the canonical family whose finitely many α-core allocations include w. Drawing attention to the similarity of this construct to the method of singling out certain Nash equilibria of a strategic form game g as subgame perfect equilibria of a richer extensive form structure consistent with g introduced by Selten (1975), we also note that everything said above continues to hold if we replace the α-core by the β-core, provided that the TU game induced by a strategic form game is now obtained employing the minmax operator. Finally, all the definitions and results are extended to the general case, where utility is γ-semitransferable in both the strategic and cooperative environments with γ being any member of the unit interval.

- **Gomez J.C. (University of Washington,Bothell)**
An Aspiration Core Convergence Theorem

We consider the convergence properties of solution concepts that: (i) coincide with the core when the latter is non-empty and (ii) are nonempty for some collection of non-balanced games. Among the concepts we study are the C-core (Guesnerie and Oddou 1979 and Sun, Trockel and Yang 2008) and the aspiration core (Bennett 1989). To do so, we enlarge the number of players in a transferable utility (TU) game by using the concept of a replica game (Wooders 1980) and the equal treatment properties of approximate core allocations discussed in Wooders and Zame (1984) and, more recently, in Wooders (2010). Our main result states that, as ε converges to zero, the ε-core of a replica game converges to the (replicated) aspiration core of the original game. No balancedness conditions are imposed on the original game.

Allocation 2

- **Büyükboyacı M. (METU)**
The Effect of Bankruptcy Rules on Investment Behavior: An Experimental Test

Bankruptcy problems deal with the following problem: the monetary worth of a bankrupt firm is to be allocated among its creditors. Each creditor holds a claim on the firm and the firm's liquidation value is less than the total of the creditors' claims. The axiomatic literature provided a large variety of "bankruptcy rules" as solutions to this problem. Among them, three are significantly more prominent than the others. The Proportional rule (PRO) suggests to allocate the estate proportionally to the claims. The Equal Awards rule (EA) suggests equal division of the estate. The Equal Losses rule (EL) alternatively suggests to equate across agents, the difference between his claim and his share. In this study, we compare the elicited investment levels by these bankruptcy rules according to the game suggested in Kıbrıs Ö. ve Kıbrıs A. (2013) through an experiment. Kıbrıs Ö. ve Kıbrıs A. (2013) found that EL brings higher investment levels than PRO. In the experiment we confirm their findings when the success rate (bankruptcy rate) for the investment is low (high). However, we find no difference between investment levels under PRO and EL when the success rate (bankruptcy rate) is high (low).

- **Flanagan F.X. (Wake Forest University)**
Group Housing Allocation: Collusion, Fairness and Efficiency

We model student housing allocation mechanisms at universities as a one-sided matching market in which students have preferences over roommates and rooms. We show that in general there is no best "fair" mechanism, which means there is no mechanism, which treats similar students equivalently and always results in a weakly more efficient allocation than all other fair mechanisms. We also show that, due to the trade-off between room quality and roommate quality, certain mechanism allow, and encourage, groups of students to collude. We apply these results to data collected from the housing allocation process at a specific university and show that certain "collusive" groups are able to improve the room allocation of their members, at the cost of non-collusive groups.

- **Rastegari B. (University of Glasgow)**
Pareto Optimality in the Many-to-Many House Allocation Problem with Indifference

We consider Pareto-optimal matchings (POMs) in a many-to-many market of applicants and courses where applicants have preferences, which may include ties, over individual courses and lexicographic preferences over sets of courses. Since this is the most general setting examined so far in the literature, our work unifies and generalizes several known results. Specifically, we characterize POMs and introduce the Generalized Serial Dictatorship Mechanism with Ties (GSDT) that effectively handles ties via properties of network flows. We show that GSDT can generate all POMs using different priority orderings over the applicants, but it satisfies truthfulness only for certain such orderings. This shortcoming is not specific to our mechanism; we show that any mechanism generating all POMs in our setting is prone to strategic manipulation. This is in contrast to the one-to-one case (with or without ties), for which truthful mechanisms generating all POMs do exist.

- **Thomson W. (University of Rochester)**
On The Water Allocation Problem

We revisit the problem of allocating a resource among a group of agents who are linearly ordered, when the resource can only flow in one direction. We formulate a variety of monotonicity and independence conditions and characterize several rules, some of which are new to the literature.

Strategic Communication

- **Gesche T. (University of Zurich)**
Debiasing Strategic Communication?

This paper studies strategic communication with lying costs and hidden conflicts of interest. I present a simple economic mechanism under which the disclosure of conflicts of interest can lead to more biased messages with average receivers following them more closely. Receivers who delegate their choice or who are naive towards the conflict of interest are then hurt by disclosure while non-delegating, rational receivers benefit from it. In consequence, disclosure is often not a Pareto-improvement among the set of receivers and can even lead to a decrease in efficiency. I find that the correlation between the sender's incentives to bias his message and the true state of the world is decisive for determining i) when mandatory disclosure hurts receivers, ii) when senders would voluntarily commit to disclose their conflicts of interests, and iii) when mandatory disclosure is efficient.

- **Özyurt S. (Sabancı University)**
A Fraudulent Expert and Short-Lived Customers

A market where short-lived customers interact with a long-lived expert is considered. An expert privately observes whether or not a particular treatment is necessary for his customers and has an incentive to recommend the treatment even if it is unnecessary. Customers imperfectly observe the expert's past actions. Truthful reporting at all times yields the expert his best equilibrium payoff when the expert is known to be opportunist (i.e., rational in the usual sense). If the customers believe that the expert might be an honest type, who always reports truthfully, then the expert can build his reputation for honesty, so then he defrauds his customers to achieve a higher payoff. Deception during an unbounded length of time is a zero-probability event in equilibrium. However, it is a probability one event (in some of the equilibrium) when the expert's customer is also a long-lived agent.

- **Yıldırım M. (Melikşah University)**
Pre-Contest Communication Incentives

To demonstrate resolution and psychological strength, players often engage in pre-contest communication by publicly stating their desire to win an upcoming contest. Existing explanations for this phenomenon revolve around incomplete information and signaling. In this paper, I offer a complementary explanation that does not rely on signaling. Within a complete information setup, I show that when communication involves not only an audience cost, e.g., a reputation loss, in case of a false statement (as assumed in the literature) but also an audience reward, e.g., a credibility gain, in case of a true statement, players may have an incentive for pre-contest communication.

- **Wang R. (University of Edinburgh)**
Correlated Information Games

We study a 2 x 2 symmetric discrete Bayesian game permitting players' private information correlated. We focus on pure strategy Bayesian Nash equilibrium in both strategic-substitutes and strategic-complements settings and assume players' private information are subject to a symmetric bivariate Gaussian distribution with statistic correlation. The necessary and sufficient condition of legitimately using cutoff strategy to solve

the game, the necessary and sufficient condition to differentiate contraction and noncontraction best response functions, and characterizations of the set of equilibria and their stability properties in strategic-substitutes game and strategic-complements game are obtained. Finally, comparative statics of the symmetric equilibrium in strategic-substitutes game are analyzed and interpreted in an entry context to explore how private information correlation affects players' strategic behaviour.

Interaction in Networks

- **Kovarik J. (University of the Basque Country)**
(Anti-) Coordination and Equilibrium Selection in Networks

We study coordination and equilibrium selection in network games where players have conflicting preferences over equilibria. Participants in our experiment interact with their neighbours in a fixed network to play a bilateral anti-coordination game. Across treatments, we vary the structure of the underlying network as well as the amount of information participants have about it. We find that, while coordination failure is very persistent in some networks, it is much less frequent in others. In addition, even though there is a large multiplicity of Nash equilibria theoretically, the network structure induces regularities on selection which cannot be understood by relying on conventional equilibrium refinements. Local (endogenous) information is as effective in ensuring coordination as full information.

- **Kvasow D. (University of Adelaide)**
From Sabotage Games to Border Protection

Sabotage games on a graph involve Runner who wants to travel between two given vertices and Blocker who aims to prevent Runner from arriving at his destination by destroying edges. This paper introduces and studies several generalizations of sabotage games. First, it completely characterizes games with multiple destinations on weighted trees for both local and global cutting rules of arbitrary capacity, using an algorithmic labeling procedure. Second, it introduces the transformation procedure that associates a weighted tree with any weighted graph. The procedure allows complete characterization of games on weighted graphs for local cutting rules of arbitrary capacity and provides sufficient conditions for Blocker to win for global cutting rules. The applications of sabotage games to the issue of border security are discussed.

- **Kumar R. (Queen's University Belfast)**
Resource Allocation in a Network

A fix amount of resource must be divided to a group of agents connected in a social network. Agents care about how much resource they receive as well as how much resource their friends receive. We study the case where the planner has little to no information about the network. The paper is divided into two parts.
In the first part, we study the scenario where the planner has the ability to ask agents to report their connections to other agents. In this scenario agents may have the incentive to game the system by lying about their connections. Therefore, we study mechanisms that incentivize agents to report their true connections (strategy-proofness). We focus on strategy- proof mechanisms that work for a wide range of utility functions, thus making the analysis robust.
In the second part, we study the scenario where the planner cannot elicit the connections of the agents, perhaps due to privacy concerns. We set up a non-cooperative game that allows a more efficient allocation of the resource. We analyze the efficiency gains achieved when the planner has the ability to ask agents information compared to when the planner cannot elicit information from agents.

- **Bolton G. (University of Texas in Dallas)**
Inflated Reputations: Leniency and Moral Wiggle Room in Trader Feedback Systems

Reputation systems associated with Internet markets are known to be subject to strategic manipulation. The experiment we present suggests that this manipulation can extend to factors that have heretofore been

overlooked: the leniency and moral wiggle room that arise from uncertainty about the source of transaction problems. The uncertainty amplifies the 'brag-and-moan' nature of Internet feedback, reducing the informativeness of the feedback system and diminishing the incentives for honest seller behavior. Under uncertainty, buyers pay about the same prices but get significantly less.

Matching 3

- **Hoyer B. (University of Paderborn)**
Matching Strategies of Heterogeneous Agents in a University Clearinghouse

In this work we consider the matching process used in a clearinghouse at the faculty of Business Administration and Economics at the University of Paderborn to find out which strategies heterogeneous constraint rational agents are using when they take part in a clearinghouse which uses the Boston Mechanism. We use data from the actual clearinghouse as well as a survey conducted in March 2015. The survey data allows us to compare students' actual and stated preferences and extract strategies used in the clearinghouse. Additionally, we test different matching algorithms using the stated and the true preferences of students and analyze the outcomes with regard to their efficiency and stability properties. We will thus be able to compare the results found in experiments on school choice to the results in an actual clearinghouse with students' real and stated preferences. Additionally we aim to add to the literature on matching with heterogeneous constrained rational actors.

- **Huesmann K. (University of Cologne)**
Constraints on Matching Markets Based on Moral Concerns

Various markets ban or heavily restrict monetary transfers which is often motivated by moral concerns. However, it appears to be disputable whether the observed restrictions on transfers are the appropriate market design answer to these concerns. Instead of exogenously imposing restrictions on transfers on a matching market we introduce a constraint based on moral concerns and study its market design implications. The desideratum we concentrate on is discrimination-freeness, i.e. one's access to a good should not depend on one's financial wealth. We show that matchings without monetary transfers based on ordinal object rankings are already at the efficient frontier of discrimination-free social choice functions. Implementable social choice functions are discrimination-free if and only if an agent's object assignment only depends on her rank order list and her money assignment is constant. If money can be used outside the market designer's control even externality-freeness is needed: an agent's object assignment has to be independent of other agents' types. We discuss several applications in the context of discrimination-freeness including compensation for kidney donors.

- **Kotowski M. (Harvard University)**
Multi-period Matching

We examine a multi-period, bilateral matching market. Sufficient conditions for the existence of a dynamically-stable matching are proposed. These conditions accommodate common forms of inter-temporal preference complementarities. In a multi-period market with transfers, expanded access to financial services, such as savings and credit, may lead to Pareto-inferior outcomes. We further extend our analysis to incorporate imperfect information and path-dependent learning. Re-matching after the revelation of new information is often not Pareto improving, suggesting a fundamental fragility of interim markets. We relate our analysis to market unraveling, to the exposure problem, and to the importance of commitment, or lack thereof, in dynamic markets.

- **Morimoto S. (Kobe University)**

Strategy-proofness, Efficiency, and the Core in Matching Problems with Transfers

We study a class of one-to-one matching problems in which monetary transfers are possible. Sönmez (1999, Econometrica 67: 677-689) establishes that, for a general class of indivisible goods allocation problems without monetary transfers, if an allocation rule satisfies strategy-proofness, efficiency, and individual rationality, then, for each preference profile under which the core is non-empty, each pair of core allocations are Pareto-indifferent and the allocation chosen by the rule is in the core. In this study, we show that the result of Sönmez (1999) extends to our environment if an allocation rule satisfies no subsidy in addition to the three properties. As a corollary of this result, we show that, under individual rationality and no subsidy, efficiency is incompatible with strategy-proofness in many situations. We also establish that, in the two-sided matching problem with transfers, the "one-sided optimal core allocation rule" is the only rule that satisfies one-sided strategy proofness, efficiency, individual rationality, and no subsidy.

Political Economy 2

- **Rebiere T. (Conservatoire National des Arts et Metiers, Paris)**
How Many Educated Workers Do You Wish for Your Economy? European Targets, Optimal Public Spending, and Labor Market Impact

This paper studies optimal taxation schemes for education in a search-matching model where the labor market is divided between a high-skill and a low-skill sector. Two public policy targets - maximizing the global employment level and optimizing the social surplus - are studied according to three different public taxation strategies. We calibrate our model using evidence from fourteen European countries, and compare our results with the target from the Europe 2020 Agenda for achievement in higher education. We show that, with current labor market characteristics, the target set by governments seems compatible with the social surplus maximization objective in some countries, while being too high for other countries. For all countries, maximizing employment would imply higher educational spending than that required for the social surplus to reach its maximum.

- **Turley T. (Brigham Young University)**
You Get What You Deserve: Experimental Evidence on Redistribution Preferences in China, Paraguay and Uganda

We run an experiment in China, Paraguay and Uganda to determine how preferences for redistribution depend on the cause of the original inequality. Unlike previous studies, we move beyond the rudimentary luck/skill distinction in designing the activities subjects use to generate their income. First, we employ tasks that differentiate between two types of luck: (1) chance, in which the subject's payoff is the realization of a lottery chosen exogenously by the experimenter, and (2) risk, in which the subject herself chooses between lotteries with known payoff distributions. Second, we decompose skill into its constituent categories: (a) aptitude, as measured by an IQ test, and (b) effort, as measured by a computerized real-effort task that controls for baseline ability. We hypothesize that subjects will exhibit a preference for redistributing their group's income in order to achieve a more equitable distribution, and that the magnitude of this preference is decreasing with how much control subjects feel they have over their income level. Specifically, we hypothesize that redistribution levels will consistently be greatest in the chance treatment and least in the effort treatment, and that we can predict the likelihood of subjects redistributing more income from risk than from aptitude based on a priori knowledge about a country's average beliefs about locus of control. Though some of our results are only marginally statistically significant, we find that we can confirm our hypothesized universal attitudes toward chance and effort. Furthermore, Ugandan subjects, with on average an external locus of control, exhibit higher redistribution for aptitude relative to risk, whereas Chinese and Paraguayan subjects, with on average an internal locus of control, exhibit the opposite. Our results are related to the question of designing optimal tax policies when inequality arises, or is perceived to arise, from different sources.

- **Yıldırım H. (Duke University)**

"Giving" in to Social Pressure

In light of recent evidence, we develop a theory of charitable giving in which donors feel social pressure from a direct solicitation. We show that equilibrium donations are concentrated around a social norm: donors below the norm increase giving while those above the norm reduce it. Despite a higher level of the public good, relatively poor and/or low altruism givers fare worse under social pressure and would avoid the solicitor at a cost. Aggregate donor welfare improves to the extent that the added social motive alleviates the underprovision of the public good; however, overprovision may result. Our theory therefore predicts a light-handed regulation for charitable solicitations, which is consistent with their exemption from the popular Do Not Call list in the U.S. We further show that contrary to pure altruism, a more equal income distribution may produce more of the public good. In fundraising campaigns where a social norm is not apparent, one may emerge endogenously if donors are not too heterogeneous. In fact, multiple social norms may form, which offers a focal point argument for suggested donations.

- **Weymark J.A. (Vanderbilt University)**
Voting Over Selfishly Optimal Nonlinear Income Tax Schedules

Majority voting over the nonlinear income tax schedules proposed by a continuum of individuals with different labor productivities who have quasilinear-in-consumption preferences is considered. Each individual proposes the tax schedule that is selfishly optimal for him. Röell (unpublished manuscript, 2012) has identified some of the qualitative properties of these schedules. She has also shown that the individual preferences over these schedules are single-peaked and so the Median Voter Theorem applies. In this article, it is shown that each of the selfishly optimal schedules is a combination of the maxi-min and maxi-max schedules along with a region of bunching in a neighborhood of the proposer's skill type. Techniques introduced by Vincent and Mason (1967, NASA Contractor Report CR-744) are used to show that the bunching region can be identified by solving a simple unconstrained optimization problem. The characterization of the selfishly optimal schedules is used to provide a relatively simple proof that individuals have single-peaked preferences over them. In the majority rule equilibrium, marginal tax rates are negative for low-skilled individuals and positive for high-skilled individuals except at the endpoints of the skill distribution where they are typically zero.

Mechanism Design 3 (Organized By Weymark J.A. & Sen A.)

- **Mierendorff K. (University College London)**
Auctions with Limited Commitment

We study auction design with limited commitment in a standard auction environment. The seller has a single object and can conduct an infinite sequence of standard auctions with reserve prices to maximize her expected profit. In each period, the seller can commit to a reserve price for the current period but cannot commit to future reserve prices. We analyze the problem with limited commitment through an auxiliary mechanism design problem with full commitment, in which an additional constraint reflects the sequential rationality of the seller. We characterize the maximal profit achievable in any perfect Bayesian equilibrium in the limit as the period length vanishes. The static full commitment profit is not achievable but the seller can always guarantee the profit of an efficient auction. If the number of buyers exceeds a cutoff, the efficient auction is optimal. Otherwise, the efficient auction is not optimal, and we give conditions under which the optimal solution consists of an initial auction with a non-trivial reserve price followed by a continuously decreasing price path. The solution is described by a simple ordinary differential equation. Our analysis draws insights from bargaining, auctions, and mechanism design.

- **Mishra D. (Indian Statistical Institute)**
Local Incentive Compatibility with Transfers

We consider locally incentive compatible mechanisms with deterministic allocation rules and transfers with quasilinear utility. Our focus in on ordinal type spaces, which are generated by considering a set of ordinal preferences over alternatives and then considering all non-negative type vectors representing such preferences. We identify a rich class of ordinal type spaces, which includes the single peaked type space, where local incentive compatibility does not imply incentive compatibility. Our main result shows that in such type spaces, a mechanism is locally incentive compatible and payment-only incentive compatible if and only if it is incentive compatible. Payment-only incentive compatibility requires that a mechanism that generates the same allocation at two types must have the same payment at those two types.

- **Ruckert D. (University of Cologne)**
Robust Mechanism Design and Social Preferences

We study two classics in mechanism design: trade between two privately informed parties and redistribution among agents with private information about their abilities. We characterize optimal mechanisms under selfish preferences and present experimental evidence that a non-negligible fraction of individuals deviates from the intended behavior. We show that this can be explained by models of social preferences and introduce the notion of a social-preference-robust mechanism. We characterize the optimal mechanisms in this class and present experimental evidence that they successfully control behavior. Finally, we compare the performance of the optimal mechanisms for selfish agents and the optimal social-preference-robust mechanisms.

- **Anbarcı N. (Deakin University)**
Designing Fair Tiebreak Mechanisms the Case of Fifa Penalty Shootouts

In the current FIFA penalty shootout mechanism, a coin toss decides which team will kick first. Empirical evidence suggests that the team taking the first kick has a higher probability to win a shootout. We design sequentially fair shootout mechanisms such that in all symmetric Markov-perfect equilibria each of the skill-balanced teams has exactly 50% chance to win whenever the score is tied at any round. Consistent with empirical evidence, we show that the current mechanism is not sequentially fair and characterize all sequentially fair mechanisms. Taking additional desirable properties into consideration, we propose and uniquely characterize a practical mechanism

Parallel Sessions July 3 (14.00-16.00)

Assignments 1

- **Atay A. (University of Barcelona)**
Generalized Three-Sided Assignment Markets Consistency and Core

A class of three-sided markets (and games) is considered, where value is generated by pairs or triplets of agents belonging to different sectors, as well as by individuals. For these markets we analyze the situation that arises when some agents leave the market with some payoff. To this end, we introduce the derived market (and game) and relate it to the Davis and Maschler (1965) reduced game. Consistency with respect to the derived market, together with singleness best and individual anti-monotonicity axiomatically characterize the core for these generalized three-sided assignment markets. These markets may have an empty core, but we define a balanced subclass, where the worth of each triplet is defined as the addition of the worths of the pairs it contains.

- **Nesterov A.S (WZB, Berlin)**
Fairness and Efficiency in a Random Assignment: Three Impossibility Results

We consider the problem of allocating N indivisible objects among N agents according to their preferences when transfers are absent. We study the tradeoff between fairness and efficiency in the class of strategy-proof mechanisms. The main finding is that for strategy-proof mechanisms the following efficiency and fairness criteria are mutually incompatible: (1) Ex-post efficiency and envy-freeness, (2) ordinal efficiency and weak envy-freeness and (3) ordinal efficiency and equal division lower bound. Result 1 is the first impossibility result for this setting that uses ex-post efficiency; results 2 and 3 are more practical than similar results in the literature. In addition, for N = 3 we provide two characterizations of the celebrated random serial dictatorship mechanism: it is the unique strategy-proof, ex-post efficient mechanism that (4) provides agents that have the same ordinal preferences with assignments not dominated by each other (weak envy-freeness among equals), or (5) provides agents that the same cardinal preferences with assignments of equal expected utility (symmetry). These results strengthen the characterization by Bogomolnaia and Moulin (2001); result 5 implies the impossibility result by Zhou (1990).

- **Robles F. (University of Barcelona)**
One-Seller Assignment Markets with Multi-Unit Demands: Core and Competitive Equilibrium

We consider an assignment market with one seller who owns several indivisible heterogeneous goods and many buyers each willing to buy up to a given capacity. Our aim is to study the relationship between the core of the game and the set of competitive equilibria. The core is non-empty and it has a lattice structure which contains the allocation in which every buyer gets his marginal contribution to the grand coalition. The set of competitive equilibrium price vectors also has a lattice structure and we determine the minimum and maximum competitive equilibrium prices. Necessary and sufficient conditions under which the buyers-optimal and the seller-optimal core allocations come from a competitive equilibrium are provided. In addition, we characterize in terms of the valuation matrix the coincidence between the core and the set of competitive equilibrium payoff vectors. As a consequence, we obtain that this coincidence always holds if the capacities of all buyers are large enough. Finally, we introduce a mechanism in order to implement the buyers-optimal core allocation.

- **Alkan A. (Sabancı University)**
Pairing Games and Markets

Pairing Games or Markets studied here are the non-two-sided NTU generalization of assignment games. We show that the Equilibrium Set is nonempty, that it is the set of stable allocations or the set of semistable allocations, and that it has several notable structural properties. We also introduce the solution concept of pseudostable allocations and show that they are in the Demand Bargaining Set. We give a dynamic Market Procedure that reaches the Equilibrium Set in a bounded number of steps. We use elementary tools of graph theory and a representation theorem obtained here.

Auctions 4

- **Mass H. (University of Cologne)**
The Limits of Non-discriminatory Mechanisms in Procurement

Although discrimination in procurement is undesirable and procurement rules are supposed to prevent it, discrimination is still present. As shown by Dep and Pai, even anonymity and equal treatment of bidders do not rule out discrimination. We provide rules which are sufficient and essential for the absence of discrimination. However, they are not compatible with efficiency.

- **Kasberger B. (University of Vienna)**
On the Clock of the Combinatorial Clock Auction

The Combinatorial Clock Auction (CCA) has become a standard mechanism in spectrum auctions during the past years. Quite a few auction outcomes generated a surprisingly high revenue and stakeholders discussed the possibility to game the auction. In this paper we analyze the impact of indifferences in the clock phase on auction revenue and efficiency. We analyze the CCA without the necessity of market clearing in the clock and mainly focus on high-revenue efficient equilibria. We show that if bidders know that the final allocation is in the interior, they have ample opportunities to increase or decrease the revenue compared to truthful bidding. Moreover, there are (efficient) equilibria in which no private information is revealed in the clock phase and in which bidders bid above or below value in the supplementary phase. In a private value setting, the role of the clock as a means of price and package discovery is therefore questionable. The indifferences in the clock and the bidding above or below value may pose difficulties in an empirical analysis of the CCA.
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Allocations 3

- **Kazumura T. (Osaka University)**
Anonymous Mechanism for Object Allocation without Quasilinearity

We consider the problem of allocating a set of indivisible objects to a set of agents. Each agent can receive at most one object. Transfers are allowed but the preference of each agent need not be quasilinear. Our aim is to investigate the class of mechanisms satisfying anonymity in welfare (AW), dominant strategy incentive compatibility (DSIC), individual rationality (IR), and no subsidy (NS). AW requires that if preferences of a pair of agents are interchanged, then the utility obtained in the mechanism must also be interchanged. NS requires that transfer amounts are non-negative
First we consider the single object case. Here we do not assume that the object is always assigned. We introduce a mechanisms called Vickrey with variable reserve price (VVRP) mechanisms. A VVRP mechanism is parametrized by a reserve price function that associates with each profile of (n - 1) preferences a real number, where n is the number of agents. At a preference profile, the reserve price of an agent is the value of the reserve price function evaluated at the other (n -1) agents' preferences. Given the preference of an agent, his willingness to pay is the unique monetary amount at which the agent is indifferent between getting the object with that payment and not getting the object with zero payment. At every preference profile, if there is no one whose willingness to pay is higher than his reserve price, a VVRP does not assign the object. Else, it assigns the object to the agent with the highest willingness to pay and he pays and he pays the maximum of the second highest willingness to pay and his reserve price. The other agents pay zero. We show that a mechanism is AW, DSIC, IR and SF if and only if it is a VVRP mechanism.

Second, we consider the case where there are several different objects. Here, we assume that the objects are always assigned and the number of agents is larger than the number of objects. In this case, Morimoto and Serizawa (2014) show that a DSIC mechanism satisfies no envy, IR, and NS if and only if it is a minimum price Walrasian (MPW) mechanism. We show that for the two-object case, a mechanism is DSIC, AW, IR, and NS if and only if it is a MPW mechanism.

- **Klamler C. (University of Graz)**
Maximin Envy-Free Division of Indivisible Items

In this paper we are concerned with the division of indivisible items among two players, based exclusively on their rankings of the items. We prove various results concerning the possibility for envy-free, maximin and efficient allocations, providing conditions on the players' rankings necessary for the existence of such an allocation. In addition we propose an algorithm for the maximin envy-free allocation of items.

- **Akyol E. (TOBB-ETU)**
Welfare Comparison of Allocation Mechanisms under Incomplete Information

We study the problem of allocating n objects to n agents and consider an incomplete information setting in which each agent's preference ranking is privately known. We show that when each agent's ranking over objects is independent of other agents' rankings and each possible ranking is equally likely, the celebrated Random Serial Dictatorship mechanism is unambiguously welfare inferior to another method, the Restricted Ranking mechanism, when the number of agents and objects is large. More precisely, every type of every agent has a higher interim utility under the Restricted Ranking mechanism. This result also has an implication about the welfare comparison of two widely used allocation methods for school choice, the Deferred Acceptance (DA) mechanism and the Boston mechanism: The Boston mechanism is welfare superior to the DA mechanism in the same strong manner in a large economy when each school ranks students identically and has one available seat.

- **Szwagrzak K. (University of Southern Denmark)**
Priority Classes and Weighted Constrained Equal Awards Rules for the Claims Problem

We revisit the ``claims problem'' (Oneill, MSS 1982), where a group of individuals have claims on a resource but there is not enough of it to honor all of the claims. We characterize the rules satisfying three well-known invariance axioms: consistency, composition up, and claims truncation invariance. They are priority-augmented versions of the standard weighted constrained equal awards rules, also known as weighted gains methods (Moulin, Econometrica 2000): individuals are sorted into priority classes; the resource is distributed among the individuals in the first priority class using a weighted constrained equal awards rule; if some of the resource is left over, then it is distributed among the individuals in the second priority class, again using a weighted constrained equal awards rule; the distribution carries on in this way until the resource is exhausted.
Our characterization extends to a generalized version of the claims problem where there are multiple divisible and indivisible resources and individuals have claims on each of these.

Matching 4

- **Arnosti N. (Stanford University)**
Shortlists in Centralized Clearing Houses

Stable matching mechanisms are used to clear many two-sided markets. In most settings, participants' lists tend to be short (even if there are many potentially acceptable matches). This paper studies the consequences of this fact, and focuses on two broad questions. First, when lists are short, what is the quantity and quality of matches formed through the clearinghouse? Second, what are the effects of introducing an aftermarket which allows agents left unmatched by the clearinghouse to find one another?
The answers to these questions depend crucially on the extent and form of correlations in agent preferences. I consider three canonical preference structures: fully independent (or idiosyncratic) preferences, vertical

preferences (agents agree on the attractiveness of those on the opposite side), and aligned preferences (potential partners agree on the attractiveness of their match).

I find that when agent preferences are idiosyncratic, more matches form than when agents are vertically differentiated. Perhaps more surprisingly, I show that the case of aligned preferences causes the fewest matches to form. When considering quality of matches, the story reverses itself: aligned preferences produce the most high quality matches, followed by correlated preferences, with independent preferences producing the fewest. These facts have implications for the design of priority structures and tie-breaking procedures in school choice settings, as they point to a fundamental tradeoff between matching many students, and maximizing the number of students who get one of their top choices.

Regarding the role of the aftermarket, I find that when preferences are aligned, the aftermarket unambiguously improves the welfare of both sides. In other cases, however, the introduction of an aftermarket has multiple competing effects, and may either raise or lower aggregate welfare. This suggests that when designing an aftermarket, the extent and form of correlations in agent preferences are an important factor to consider.

- **Gudmundsson J. (Lund University)**
Sequences in Pairing Problems

Are any of the negative results on pairing problems overturned when the pairing of agents is allowed to change systematically over time? By alternating between pairings we can "balance" the interest of the agents and thereby provide improvements in terms of welfare and fairness, but can we also pair agents in a stable way and ensure they never lie about their preferences? To answer these questions, we introduce sequences, lists of matchings that are repeated over time, in two-sided ("marriage") and general pairing ("roommate") problems. An agent compares sequences by dominance in terms of successive sums of ordered frequencies (ssd): she prefers the sequence $\sum$ to $\sum'$ if she is matched more frequently with her most preferred agent in $\sum$ than in $\sum'$; more frequently with her two most preferred agents in $\sum$ than in $\sum'$; and so on. Stable sequences are natural extensions of stable matchings; case in point, we show that a sequence of stable matchings is ssd-stable. In addition, there are general pairing problems that have stable sequences but no stable matching.

No strategy-proof rule always selects stable matchings (Roth, 1982). In contrast, we design a weakly group ssd–strategy-proof rule that selects ssd-stable sequences. We call the rule Compromises and Rewards, or CR. In contrast to the Deferred Acceptance rule, CR treats the two sides symmetrically. We say it is side-neutral. For general pairing problems, Generalized CR is ssd–5-stable (cannot be blocked by groups of five or fewer), weakly ssd–strategy-proof, and anonymous. We also show that our positive results are the most one can hope for.

- **Papai S. (Concordia University)**
Reasonably and Securely Stable Matching

We are interested in stability concepts that are weaker than the standard stability concept in the context of matching agents to objects on a one-to-one basis, when the objects are matched to agents based on strict priorities for each object. The standard stability concept is the usual core stability that was first introduced for two-sided marriage markets, and it is well-known that in this setting stability and efficiency cannot be reconciled. If we insist on efficiency, then we must consider weaker notions of stability in order to discover matching rules that satisfy these criteria for arbitrary strict priorities (see Ergin (2002) and Kesten (2006)). We examine two such weaker notions of stability in this paper, which are called Reasonable Stability and Secure Stability.

- **Park J. (Yonsei University)**
Competitive Equilibrium and Singleton Cores in Generalized Matching Problems

We study competitive equilibria in generalized matching problems. We show that, if there is a competitive matching, then the core is a singleton consisting of the competitive matching. That is, the singleton core is necessary for the existence of competitive equilibria. We also show that a competitive equilibrium exists if and only if the top trading cycles algorithm yields a feasible matching. Hence, we can use the top trading cycles algorithm to test whether a competitive equilibrium exists and to construct a competitive equilibrium if one

exists. Lastly, in the context of bilateral matching problems, we compare the condition for the existence of competitive matchings with other conditions for the existence or uniqueness of stable matchings.

Queuing

- **Kayı Ç. (Del Rosario University)**
Queuing Problems with Exit Option

A set of agents with possibly different waiting costs and different service valuations have to receive the same service one after the other. Efficiency requires to maximize total welfare. Fairness requires to treat equal agents equally. One must form a queue, set up monetary transfers to compensate agents having to wait, and not a priori arbitrarily exclude agents from positions. As one may not know agents' waiting costs, they may have no incentive to reveal them. First, we introduce an algorithm that computes all Pareto-efficient queues. Then, we show that in the domain of problems in which it is optimal to serve all the agents, the Largest Equally Distributed Pairwise Pivotal (LEDPP) rule is the unique rule that satisfies Pareto-efficiency, equal treatment of equals in welfare, symmetry, and strategy-proofness and it also satisfies individual rationality (Theorem 1). Finally, we show that there is no rule that satisfies Pareto-efficiency, equal treatment of equals in welfare, and strategy-proofness (Theorem 2). This result is in striking contrast to the possibility in queueing problems without exit option (Kayı and Ramaekers, 2010).

- **Onderstal S. (University of Amsterdam and Tinbergen Institute)**
Trading Places: An Experimental Comparison of Reallocation Mechanisms for Priority Queuing

In a laboratory experiment, we compare two auction mechanisms that determine the sequence of service to queued customers. Two innovative experimental protocols are used to examine queuing behavior in a laboratory environment. We find that on average, the server-initiated auction and the customer-initiated auction perform equally well in terms of efficiency gain. Moreover, subjects indicate that they find the server-initiated auction a fairer mechanism than the customer-initiated auction. When voting between the two auctions, subjects tended to favor the server-initiated auction. We consider both sunk-cost effects and endowment effects to explain behavioral deviations from standard theory predictions.

- **Breinbjerg J. N. (University of Southern Denmark)**
Strategic Behavior and Social Outcomes in a Bottleneck Queue: Experimental Evidence

We theoretically and experimentally study an environment where a bottleneck facility opens and impatient players decide when to arrive. We derive equilibrium arrivals under the first-in-first-out (FIFO), last-in-first-out (LIFO), and service-in-random-order (SIRO) queue disciplines for a class of three-player games and compare these predictions to outcomes from a laboratory experiment. We find that participants in general do not behave according to equilibrium. Participants arrive with greater dispersion under LIFO and, thus, induce the lowest congestion. However, as also under FIFO and SIRO congestion is lower than the theoretical benchmark, we find that welfare is generally higher than predicted and not significantly different from LIFO.

- **Sürücü O. (Bielefeld University)**
The Impact of Time Pressure: Insights from A Queuing Experiment

We experimentally explore the effects of time pressure on decision making. Under different time allowance conditions, subjects are presented with a queueing situation and asked to join one of two queues that differ in length, server speed, and entry fee. The results can be grouped under two main categories. The first one concerns the factors driving customers' decisions in a queueing system. Only a proportion of subjects behave rationally and use the relevant information efficiently. The rest of the subjects seem to adopt a rule of thumb that ignores the information on server speed and follows the shorter queue. The second category is related to

the effects of time pressure on decision performance. A significant proportion of the population is not affected by time limitations and shows a consistent behavior throughout the treatments. On the other hand, the majority of subjects' performance is impaired by time limitations. More importantly, this impairment is not due to the stringency of the limitation but mainly due to the fact that being exposed to a time limitation, even to a loose one, brings along stress and panic, and causes subjects to use time inefficiently.

Political Economy 3

- **İriş D. (Sogang University)**
Loss-Aversion in International Environmental Agreements

In this paper, we study the impact of loss-aversion (countries put higher weight on environmental losses than gains) and reference level (threshold for catastrophic damages), on international environmental agreements. We aim to understand whether threshold act as an effective coordination device and reduce the states' incentives to pollute unabatedly while letting others cap their emission levels, when environmental damages are high (loss domain); as well as when loss averse countries negotiate in situations of low damages (gain domain). Under full symmetry, that is countries are identical in their loss-aversion and reference levels, we have showed that the form of loss-aversion we used has a positive effect on reducing the emission levels of signatory and non-signatory countries, leading to higher global welfare and for some cases to higher number of signatory countries forming a coalition. Therefore, countries could take significant environmental decisions on reducing their emissions when they believe there is a threat of an environmental catastrophe. Furthermore, if countries believe that this threat has reached a critical level, the efforts on reducing their emissions would be immense. In extension, we allow countries to be different either in their loss-aversion or reference levels. We numerically find that only countries, believing the threat has reached a critical level, form the coalition if they are many in numbers. Otherwise, countries believe the threat has not reached a critical level can also join the coalition. Furthermore, for some cases no stable coalition or multiple stable coalitions can exists.

- **Cialowicz B. (Cracow University of Economics)**
Axiomatic Analysis of innovative Changes in a Consumer Sphere of the Arrow-Debreu Economy - A Schumpeterian Approach

The paper is coherent with previous modelling of Schumpeterian evolution in the formal apparatus of modern Arrow-Debreu theory of general equilibrium. Its main aim is to give theoretical account of the innovative processes in a demand sphere of economic system and demonstrate that consumers innovativeness based on their individual preference relations plays important role in process of diffusion of innovations. To perform these tasks the following tools will be employed: the set-theoretical and topological apparatus borrowed from general equilibrium theory, the static model of the Debreu private ownership economy in the form of a multi-range relational system and the mathematical idea of a (quasi)-semidynamical system

- **Lipieta A. (Cracow University of Economics)**
Comparative Analysis of Mechanisms of Schumpeterian Evolution

The paper extends the research program of modeling the Schumpeterian vision of innovative development in the Arrow-Debreu theory of general equilibrium. To study changes in the production sector as well as in the whole economy the concept of extension of the systems under study is introduced. It enables us to model, the mechanisms of Schumpeterian evolution in the conceptual apparatus of the Hurwicz's theory of economic mechanisms. In this context the paper aims at the comparative analysis of two types of mechanisms

distinguished within Schumpeterian evolution: the innovative evolution mechanism as well as the adopting mechanism.

- **Schmidt F. (University of Mainz)**
Reactivating the Long-Term Unemployed More Effectively: Evidence from a Randomized Controlled Field Study

Long-term unemployment creates high costs for society and thus counteracting it has become an increasingly important focus of economic policy. Various active labor market policies addressing the problems of unemployment have been implemented, but the effectiveness of these policies differs widely. The general thrust of these policies is (i) to increase the probability that the unemployed re-enter employment, preferably on a permanent basis, and (ii) to increase productivity and thus future wages of the unemployed, thereby reducing the social and economic consequences associated with high long-term unemployment. In most cases, existing policies are designed based on the principles of re-adjusting economic incentives and reactivating human capital.
Unfortunately, however, the (social) rate of return on these policies – mostly evaluated based on observational micro-data – often tends to be low or even negative. One reason for this finding is that existing active labor market policies hardly ever take pertinent socio-psychological and non-cognitive factors into account. Factors such as self-regulatory problems with respect to goal-setting and goal attainment, though, have recently been found to play a crucial role in labor market success. The point of departure of this paper is the conjecture that if existing active labor market programs could address the relevant socio-psychological and non-cognitive factors and mechanisms in a more targeted way, both the labor market programs' reactivation rate and their cost efficiency might be improved substantially. In contrast to existing reactivation program evaluations, which are predominantly based on observational data, we obtain our evidence from a large-scale field experiment. Building on recent advances in socio-psychological theory and practice, we embedded a targeted intervention into an existing standard German reactivation program. We randomly assigned a total of 750 unemployed people to a control and a treatment group. This integration of the field experiment into a standard reactivation program ensures highest external validity while at the same time retaining full control over potential confounding factors. In the treatment groups, we addressed fundamental socio-psychological barriers to reactivation– problems concerning goal-setting and goal-attainment – by implementing a training of a self-regulatory strategy which psychologists refer to as mental contrasting with implementation intentions (MCII). We expected our MCII intervention to promote behavior that facilitates labor market reactivation by strengthening job-related activities such as getting up on time and meeting a planned time schedule as CII has been proven to be especially effective for people with self-control problems and when tailored to personally relevant contexts. The intervention and the data collection took place from the beginning of 2012 till the end of 2014. We are currently preparing the data for the econometric investigation and we hope to have first results by Mai 2015. In summary, we conducted an interdisciplinary randomized controlled trial study which will enable us to obtain causal inference about the key socio-psychological determinants of labor market reactivation success and the interactions of these determinants with the socioeconomic characteristics of the program participants. Moreover, from a policy point of view, we hope to provide conclusive causal evidence for a new labor market activation policy characterized by low costs and high societal returns.

Voting Games

- **Basteck C. (Technical University of Berlin)**
The Borda Count and Dominance Solvable Voting Games

 We analyze dominance solvability (by iterated elimination of weakly dominated strategies) of voting games with three candidates and provide sufficient and necessary conditions for the Borda Count to yield a unique winner. We find that Borda is the unique scoring rule that is dominance solvable both (i) under universal agreement on a best candidate and (ii) under universal agreement on a worst candidate and in the absence of a tie. Turning to generalized scoring rules, we find that Approval Voting violates a desirable monotonicity property: a candidate that is the unique dominance solvable winner for some preference profile, may lose the election once she gains further popularity. In contrast, a candidate that is the unique dominance solvable winner under Borda, will always remain so as her popularity increases.

- **Courtin S. (University Cergy-Pontoise)**
Dichotomous multi-type games: Shapley-Shubik and Banzhaf-Coleman power indices

This work focuses on the evaluation of the voting power in games with multiple level of approval (r-voting game). We first analyze a modification of Shapley and Banzhaf power indices when considering multiple level of approval. We also extend the concept of r-voting game to games with a coalition structure. In such a game it is supposed that players organize themselves into a priori disjoint coalitions. Our main results is an axiomatic characterization of Power indices for games with a coalition structure in the context of r-voting game.

- **Nganmeni Z. (THEMA, University Cergy-Pontoise)**
The Owen and Shapley Spatial Power Indices: A Comparison and a Generalization

Spatial games take into account the position of any voter in the space (ideal point). In order to capture individual power, Owen (1971) and Shapley (1977) defined two spatial indices aiming at generalizing the classical Shapley-Shubik (1954) power index. We show that both spatial power indices are just particular cases of a more general model based on the distances from ideal points to the possible issues.

- **Nikram E. (University of Exeter)**
A generalized Hoteling-Downs model with Incumbents

We investigate extensions of the famous Hoteling-Downs model of two-candidate elections where voter's preferences are not necessarily single peaked. Building on the work of Laffond et al. (1993) and Fischer and Ryan (1992), we study a model where one of the two candidates is an incumbent and has increased chance of winning when both propose the same policy. We show that the unique equilibrium point in the model described by Fischer and Ryan is a regular equilibrium in the sense of Harsanyi (1973). In fact, we show that the classical results of uniqueness can extend to cases where the advantage of the incumbent is sufficiently small. However, when the advantage is big the structure of the model changes in different ways and the equilibrium may no longer be unique. We provide some examples to illustrate the main characteristics of the equilibrium point and develop sufficient criteria for uniqueness. A similar analysis is provided for a model where candidates discouraged from proposing the same policy.

Allocation of Indivisible Goods (Organized by Andersson T.)

- **Erlanson A. (University of Bonn)**
Allocating divisible and indivisible resources according to conflicting claims: collectively rational solutions

We consider the problem of allocating multiple divisible and indivisible resources according to conflicting claims on these resources. We prove that choosing allocations maximizing a separable social welfare function is a consequence of three basic principles: consistency, resource monotonicity, and the independence of irrelevant alternatives.

- **Serizawa S. (Osaka University)**
When are Strategy-Proof And Efficient Rules Possible İn Objects Allocation With Money?

We consider the problem of how (indivisible) objects should be allotted to agents and how much they should pay. Each agent can get several objects and preferences can be non-quasi-linear. We investigate efficient and strategy-proof rules. First we consider domains that contain not only unit demand preferences but also at least one non unit demand (object monotonic) preference relation. We show that on those domains no rule satisfies efficiency, strategy-proofness, individual rationality, and no subsidy for losers. Next we consider domains

where preferences are object monotonic. Given a real number r, r-partially-quasi-linear domain is a domain where preferences are quasi-linear on the subset of consumption space where bundles are at least as good as getting no object and paying r, and their payments are at least as large as r. We show that for each real number r, if a domain is larger than r-partially quasi-linear domain, no rule on the domain is efficient and strategy-proof. Finally we consider the case where objects are identical and the domain contains convex preferences. We show that no rule on the domain is efficient and strategy-proof.

- **Velez R. A. (Texas A&M University)**
Perfect full implementation: a robust, simple, fair, and natural alternative

Let f be a strategy-proof social choice function for which no agent can change the outcome by misreporting her preferences without changing her welfare. Examples are the uniform rule, top trading cycles rule, and the median rules. Each perfect interim equilibrium outcome of each fixed-order sequential mechanism associated with f is f -optimal for the true preferences. This result is prior-free among all independent-type priors with common support. The fixed-order sequential mechanisms of f satisfy four key properties that economists argue in favor of truthful dominant strategy mechanisms. They are robust, simple, fair, and natural. In contrast, f 's simultaneous direct revelation mechanism may posses prior-free Nash equilibria that are not f -optimal.

- **Andersson T. (Lund University)**
Transferring Ownership of Public Housing to Existing Tenants: A Mechanism Design Approach

This paper explores situations where tenants in public houses, in a specific neighborhood, are given the legislated right to buy the houses they live in or can choose to remain in their houses and pay the regulated rent. This type of legislation has been passed in many European countries in the last 30-35 years (the U.K. Housing Act 1980 is a leading example). The main objective with this type of legislation is to transfer the ownership of the houses from the public authority to the tenants. To achieve this goal, selling prices of the public houses are typically heavily subsidized. The legislating body then faces a trade-o_ between achieving the goals of the legislation and allocating the houses efficiently. This paper investigates this specific tradeoff and identifies an allocation rule that is individually rational, equilibrium selecting, and group non-manipulable in a restricted preference domain that contains \almost all" preference profiles. In this restricted domain, the identified rule is the equilibrium selecting rule that transfers the maximum number of ownerships from the public authority to the tenants. This rule is preferred to the current U.K. system by both the existing tenants and the public authority. Finally, a dynamic process for finding the outcome of the identified rule, in a finite number of steps, is provided.

Parallel Sessions July 3 (16.30 -18.00)

Assignments 2

- **Troyan P. (University of Virginia)**
Improving Welfare in Assignment Problems: an Experimental Investigation

Many institutions face the task of allocating objects (such as university dormitories) to individuals (students) without the use of monetary transfers. A common solution to this problem is the Random Serial Dictatorship (RSD): agents are ordered randomly, and one at a time, each is assigned her favorite good according to her submitted preferences. While RSD provides each agent with a dominant strategy of ranking objects truthfully, it may produce socially undesirable outcomes whereby it is possible to make some agents substantially better off at only a small cost to others. In this paper, we study the prospect of raising welfare in assignment problems by incentivizing agents to report indifference between goods they value similarly. Specifically, we modify RSD by ordering agents earlier who report more indifference, a method similar to that used by the Stanford Graduate School of Business to assign MBA students to educational trips abroad. We test the effectiveness of our imposed incentives in a controlled laboratory experiment and find that many agents follow natural heuristics that entail reporting indifference between objects that are similar in value. Average earnings increase significantly compared to RSD, but the way in which indifference is rewarded can alter the variance in earnings. This suggests that institutions that use RSD can benefit by rewarding indifference, but should choose how to do so carefully.

- **Hafalır İ. (Carnegie Mellon University)**
Welfare-Maximizing Assignment of Agents to Hierarchical Positions

We allocate agents to three kinds of hierarchical positions: top, medium, and low. No monetary transfers are allowed. We solve for the incentive-compatible mechanism that maximizes a family of weighted social welfares including utilitarian and Rawlsian welfares. Mechanisms implementing optimal rules are Hylland and Zeckhauser (1979)'s pseudomarket mechanism with equal budgets (PM) and the Boston mechanism without priorities (BM). When the market is tough (all agents bear some risk of obtaining a low position in any incentive-compatible and feasible mechanism), then PM and BM assignments coincide and they are always optimal. Otherwise, when the market is mild, PM and BM differ and each one implements the optimal mechanisms under different curvature assumptions on virtual valuations.

- **Kratz J. (Lund University)**
Overlapping Multiple Assignments

This paper studies an allocation problem with multiple assignments, indivisible objects, no endowments and no monetary transfers, where a single object may be assigned to several agents as long as the set of agents assigned the object satisfy a compatibility constraint. It is shown that, on the domain of complete, transitive and strict preferences, group-sorting sequential dictatorships are fully characterized by four different combinations of coalitional strategyproofness, strategyproofness, Pareto efficiency, non-bossiness, group-monotonicity and group-invariance. It is also demonstrated that the characterization in Papai (2001) of sequential dictatorships for the case where assignments are not allowed to overlap is contained in the main result.

Contests

- **Kirysheva I. (European University Institute)**
Optimal Prize Allocation in Contests with Sabotage

Contest is a powerful mechanism to induce the right incentives from the agents. In a contest with multiple participants particular prize distribution can allow a principal to maximize the expected effort he gets. In the paper of [Moldovanu and Sela(2001)] it is shown that if principal allocates positive prizes it is optimal to give all the sum to the leader. However, this result does not hold if there is a possibility for a sabotages as such a prize structure creates very high incentives to use it. I show that in that case optimal prize structure may also assume positive reward for contestants that are behind. This result is always true in the case of two contestants. However, with higher number of contestants sabotage becomes a public good and therefore is a less concern for a designer. In that case when sabotage is expensive he can achieve the first best by giving the whole sum to the winner. In continuous case the solution crucially depends on the cost of sabotage. When sabotage is expensive, principal wants to give all prize to the winner, while when it is cheap it does not want to make a contest at all, and distributes all prizes equally.

- **Olszewski W. (Northwestern University)**
Effort-Maximizing Contests

We study a contest environment with a large number of players and prizes that accommodates complete and incomplete information, and heterogeneity among players and prizes. We characterize the effort-maximizing prize structure when players may differ in their marginal valuations for prizes and when the valuation may differ from the designer's cost of providing the prizes. We also provide such a characterization when players' cost of effort differs from the designer's benefit from the effort, as in Moldovanu and Sela (2001). Contest design with a discrete number of agents and prizes has proven difficult, because even for a given set of prizes: (a) In the models which have been solved in the existing literature, equilibria have complicated structure; (b) In some other settings studied in the literature, the authors were able to provide only an algorithm for deriving equilibria; (c)In some relevant settings, there is no existing characterization of equilibria. In addition, contests can have multiple equilibria, so it is not obvious whether optimal means for the best equilibrium, the worst, or something else. Because, or perhaps despite of these difficulties, Moldovanu and Sela (2001) obtained some interesting but only partial characterization of the optimal prize structure in discrete contests. We avoid these difficulties by studying the limits of equilibria of discrete contests as the number of players and prizes grow large. This analysis is possible due to the methods developed in Olszewski and Siegel (2014). We characterize the optimal prize structure in large (limit) contests. We confirm Moldovanu and Sela's results in our setting, and establish some additional features of the optimal prize structure.

- **Chen Z. (London School of Economics)**
Spying in Contests

In a symmetric private value all-pay auction (APA), both players observe their own valuations and receive noisy spying signals about the opponent's valuation from Spying Technologies (ST). When the accuracy of spying signals are the same across players, equilibrium strategies may be fully separating or partial pooling depends on the level of accuracy. The ranking between revenues under APA and first price auction (FPA) is indeterministic, while both are lower than second price auction (SPA). When players can choose which ST to acquire for free before the auction, the ST with the highest accuracy may not be chosen in equilibrium if the acquisition decision is observable to opponents. If the acquisition decision is unobservable, the frequency of acquiring the more accurate ST is decreased with the cost of acquisition. Numerical examples suggest players in APA have less incentives to spy compare to FPA.

Political Economy 4

- **Gönültaş S. (Doğuş University)**
Effects of Government Policies on Location Choice of a MNC between Asymmetric Countries

This paper investigates the effects of government policies on location choice of a multinational corporation (MNC) between two possible countries with different market sizes and labor market conditions. For this purpose, a game theoretic model is constructed where due to the presence of the high set up costs; MNC invests only in one of the two countries and export to the other with a trade cost. Creating new job opportunities is one of the main advantages of attracting foreign direct investment. Due to the different labor market conditions in the region, employment creation effect of MNC is different between two countries. Results show that subsidization is the optimal policy for both countries if employment creation effects and marginal cost of MNC are sufficiently high. Larger country uses more supportive policies unless employment creation effect of local firm is sufficiently high. The threshold value of employment creation effect alters with market size difference. For sufficiently different employment creation effects, smaller country may become the only preferred location for MNC due to the more supportive policies.

- **Sayag R.S. (Pompeu Fabra University and GSE)**
Conservative Decisions and Career Concerns

Decision makers (DM) are often perceived to be conservative in their choices, preferring to maintain the status quo rather than changing k. I develop a model which explains the existence of such status-quo bias as a rational response of a principal to the asymmetry of information between a DM and *career* concerned advisors. Two opposing factors affect the type of DM the principal wishes to appoint. First, the closer the preferences of the DM are to the principal's preferences, the more likely it is that a decision taken is favorable to the principal. Second, the more conservative the DM is, the weaker are the incentives of the advisor to engage in strategic communication. I find that if career concerns are strong enough, it is always optimal for a principal to appoint a conservative DM.

- **Rohde K. (Erasmus University Rotterdam)**
Positional Concerns Revisited – Revealing Two Sides of the coin

This paper presents an extended framework of positional concerns to account not only for people who dislike improvements for others, but also for people who like such improvements. Positional concerns are measured in the money and health domains using a ratio-comparison utility model. We find positional concerns in the majority of respondents (n=660) and these are more often altruistic than spiteful. People's desire to be better off than others seems higher in the monetary than in the health domain. These results suggest that the endowment of others may not only serve as a comparator, but may also be intrinsically valuable.

School Choice 1

- **Hakimov R. (Berlin Social Sciences Center)**
The Equitable Top Trading Cycles Mechanism for School Choice

A particular adaptation of Gale's top trading cycles procedure to school choice, the so-called TTC mechanism, has attracted much attention both in theory and practice due to its superior efficiency and incentive features. We discuss and introduce alternative adaptations of Gale's original procedure that can offer improvements over TTC in terms of equity along with various other distributional considerations. Instead of giving all the trading power to those students with the highest priority for a school, we argue for the distribution of the trading rights of all slots of each school among those who are entitled to a slot at that school, allowing them to

trade in a thick market where additional constraints can be accommodated. We propose a particular mechanism of this kind, the Equitable Top Trading Cycles (ETTC) mechanism, which is also Pareto efficient and strategy-proof just like TTC and eliminates justified envy due to pairwise exchanges. Both in simulations and in the lab, ETTC generates significantly fewer number of justified envy situations than TTC.

- **Heo E.J. (Vanderbilt University)**
Kidney Exchange with Immunosuppressants

As a tool to supplement kidney transplantation program, we introduce the usage of immunosuppressant to the kidney exchange problem. We allow more than two-way exchanges, assuming that a patient is either compatible or incompatible with a donor. Immunosuppressant (IMS, henceforth) relaxes immunological compatibility constraints, making a patient compatible with any other donors. To analyze its welfare impact, we first formulate the baseline model without IMS and define two versions of the celebrated top-trading cycles (TTC) solutions. We then extend the model by introducing IMS. We propose "monotonicity" which requires that any patient should be weakly better off when some patients use IMS. We also propose "maximal improvement" which requires that the set of patients using IMS should be chosen carefully to maximize the welfare improvement. We first show that a stronger notion of monotonicity is incompatible with Pareto efficiency. We also show that ``cardinally maximal improvement'' is not compatible with Pareto efficiency and monotonicity. Given these impossibility results, we propose two modified versions of TTC solutions and show that they satisfy Pareto efficiency, monotonicity, and maximal improvement.

- **Barlo M. (Sabancı University)**
Sticky Matching in School Choice

We analyze the school choice model and introduce costly appeals against violations of students' priorities. If these costs are sufficiently high, then some of such appeals may not provide benefits to the parents even when their priorities are violated. Instead of working with cardinal notions, our construction elicits the relevant ordinal implications of these costs, the information about the least rank decrease a student would be appealing against a priority violation (his/her stickiness degree), from the students before the assignment is determined. Then the notion of stability, the main desiderata in school choice known to be at odds with efficiency, is weakened by disregarding priority violations not worth the cost and the notion of sticky stability is obtained. The first mechanism we introduce is "efficiency improving deferred acceptance mechanism" (EIDA) and we show that it is sticky stable and superior to the Gale and Shapley (1962)'s deferred acceptance mechanism (DA) in terms of efficiency and involves truthful revelations of the stickiness degrees. The EIDA not maximally improving efficiency in the class of sticky stable solutions, leads us to design "efficiency corrected deferred acceptance mechanism" (ECDA) which turns out to be both sticky stable and efficient within the class of sticky stable mechanisms. While both mechanisms lack full incentive properties in the complete information case, in certain incomplete information settings, the former becomes immune to manipulations, whereas, the latter is still manipulable but with a diminished scope.

Strategy-Proofness 1

- **Zeng H. (Singapore Management University)**
Local Strategy-Proofness Revisited

This paper revisits the study in Sato (2013). We induce a new necessary condition: consistent connectedness, for the equivalence of local strategy-proofness and strategy-proofness, and show that it is sufficient in the class of unanimous social choice functions. Furthermore, we extend the equivalence relation to group strategy-proofness. As an application, we prove that in the class of connected domains with no-restoration, single-peakedness (on a tree) is unique for the compatibility of unanimity, anonymity and local strategy-proofness.

- **Long Y. (University of Glasgow)**
Dynamic VCG Mechanisms in Queuing

In a dynamic queueing problem, agents arrive at discrete times to use a rival resource for one period each, and exit permanently thereafter. Each agent privately knows his own per-period waiting cost, and does not observe any other information. The mechanism designer knows neither costs nor future arrivals, and can charge agents present in the system. We identify the complete class of outcome-efficient and dynamically strategy-proof mechanisms for queueing that use only the reported waiting costs of past and current cohorts to determine an agent's transfer. Finally, from within this class we characterise a canonical one that also achieves dynamic budget balance under equal treatment of equals and a weak constraint on the sequence of arrivals.

- **Chun Y. (Seoul National University)**
Welfare Lower Bounds and Strategyproofness in the Queueing Problem

We investigate the implications of welfare lower bounds together with queue-efficiency and strategy proofness in the context of the queueing problem. As a consequence, we provide alternative characterizations of the k-pivotal mechanisms (Mitra and Mutuswami [13]). First, we introduce the k-welfare lower bound, which ensures that no agent is worse off than the case where she is assigned to the kth position in the queue without any monetary transfer. For each k, we show that the k-pivotal mechanisms generate the minimal budget deficit in each queueing problem among all mechanisms satisfying queue-efficiency, strategyproofness and the k-welfare lower bound. Next, we consider a well-known welfare lower bound, the identical preferences lower bound and show that when there are odd number of agents, the k-pivotal mechanisms with k =n+1/2 generate the minimal budget deficit in each queueing problem among all mechanisms satisfying queue-efficiency, strategyproofness and the identical preferences lower bound

Market Design

- **Wang C. (Harvard University)**
Market Design for Social Preferences

Volunteer supply is widespread, yet without a price inefficiencies occur due to suppliers' inability to coordinate with each other and with demand. For these contexts, we propose a market clearinghouse mechanism that assumes suppliers have social preferences. The mechanism, a registry, combines aggregate demand information with supplier's willingness to help, and invites volunteers to help when excess demand occurs. We study three registries in an experiment that includes stochastic high-stakes demand and heterogeneous supplier costs. We find that all three registries improve efficiency dramatically; they eliminate almost all unneeded help when demand is unexpectedly low and significantly increase supply (reduce shortages) otherwise. We also find that two registries that invite exactly one registry member to help for each person needing help, rather than the other registry that continues asking members to help until someone helps, result in fewer people joining the registry, but those who join are more likely to help.

- **Ünver U. (Boston College)**
Lung Exchange

Due to the worldwide shortage of deceased donor organs for transplantation, tissue/organ donations from living donors became a significant source of transplant organs for various organs including kidneys, livers, and lungs. However, not all willing living donors can donate to their intended patients due to medical incompatibility between the donor and the patient. For any organ with living donor transplantation, such incompatibilities can be overcome by an exchange (of donors) between patients with incompatible donors. Such exchanges became widespread in the last decade for kidneys with the introduction of optimization and market design techniques to kidney exchange. Following the success of kidney exchange, a small but growing number of liver exchanges are also conducted. However, even though living donor lung transplantation is introduced more than two decades ago, lung exchange is neither practiced nor introduced. From an organizational perspective living donation is more involved for lungs than kidneys or livers for it often requires

two donors. While this makes living donation more difficult for the lungs, it also means that the role of exchange might be more prominent for living donor lung transplantation. We introduce lung exchange as a novel transplantation modality, develop an analytical lung exchange model, and introduce optimal lung exchange mechanisms under various logistical constraints. Our simulations suggest that the number of living donor lung transplants can be doubled by allowing 2-way and 3-way exchanges alone, and can be tripled in the absence of logistical constraints.

- **Citanna A. (Yeshiva University)**
Designing Insurance Markets with Moral Hazard and Nonexclusive Contracts

We design competitive markets in large insurance economies with moral hazard, under the additional constraint that contracts may be nonexclusive. In particular, we consider the situation where contracts are verifiable and enforceable within a local market, but globally, i.e., across markets, they are not. Agents can buy (or sell) insurance contracts in multiple markets subject to a (global) budget constraint. Because of local exclusivity, at equilibrium firms make zero profits. Although equilibria are indeterminate, the incentive efficient contract may not be an equilibrium. However, with a Wilsonian or a forward induction refinement, we show that equilibrium is always "third best" efficient.

Risk and Equity (Organized By Fleurbaey M.)

- **Miyagishima K. (Waseda University)**
Fair Social Orderings over Allocations of Risky Prospects

We study social welfare orderings over allocations of risky prospects when agents' future incomes are uncertain. Weak efficiency conditions, rather than usual ex ante Pareto conditions, are adopted to avoid certain drawbacks that have been noted in the literature of social choice under risk. Using the weaker efficiency conditions and fairness principles, we characterize social ranking criteria based on certainty equivalents.

- **Zuber S. (Paris 1 University and CNRS)**
Fair Intergenerational Decision Making: Ex Ante and Ex Post Approaches

Most analyses of climate policy rely on the discounted utilitarian criterion. The paper develops a set of alternative methods for policy evaluation that carefully disentangle risk aversion and inequality aversion. Following the fair social choice approach, wellbeing measures are expressed in terms of the resources (income, environmental goods, and health) available to individuals, rather than `utility'. This make it possible to allow for preference diversity within and across generations. Climate policy also involves dealing with risk. The paper discusses the difference between ex ante and ex post approaches, and shows how they can be implemented.

- **Fleurbaey M. (Princeton University)**
Long-term Discounting: Max or Min

We examine the seemingly opposite arguments offered by Gollier and Weitzman about the time structure of discount rate, in the presence of risk on the interest rate. We show that, adopting the framework of a decision-maker who maximizes in a budget set, the long-term discount rate tends to the lowest possible interest rate in a wide variety of cases, although the maximum interest rate may serve as a short-term attractor in some cases. We also question the assumption of maximization in a budget set in the context of climate policies, and examine the time structure of the discount rate in absence of this assumption. In some cases, it may be increasing.

Parallel Sessions July 4 (9.00 -11.00)

Choice 1

- **Masatlıoğlu Y. (University of Michigan)**
A Random Attention Model

This paper investigates the revealed preference when the set of alternatives attracting attention is stochastic. In the standard revealed preference argument relies on an implicit assumption that a decision maker considers all feasible alternatives. However, it is now evident that decision makers do not consider all products before making a purchase (Limited Attention). In this paper, we allow the decision maker probabilistically pays attention to subsets of all feasible alternatives. While the decision maker has stable preferences, due to stochastic attention, her choice behavior is probabilistic. Our model differs from the standard probabilistic choice literature since here the stochastic choice is not driven from the stochastic utility rather from Stochastic consideration. We illustrate how one can deduce the decision maker's preference from the observed behavior under very weak restrictions on stochastic attention sets. This makes the theory applicable to seemingly irrational choice patterns. Further, we provide a choice theoretical foundation for maximizing a single preference relation under stochastic attention.

- **Ülkü L. (Instituto Tecnologico Autonomo de Mexico)**
Stochastic Complementarity

Classical definitions of complementarity are based on cross price elasticities, and so they do not apply, for example, when goods are free. This context includes many relevant cases such as online newspapers and public attractions. We look for a complementarity notion that does not rely on price variation and that is: behavioural (based only on observable choice data); and model-free (valid whether the agent is rational or not). We uncover a conflict between properties that complementarity should intuitively possess. We discuss three ways out of the impossibility.

- **Kıbrıs Ö. (Sabancı University)**
Limited Attention and Status Quo Bias

We introduce and axiomatically characterize a model of status quo bias in which the status quo affects choices by both changing preferences and focusing attention. The resulting Limited Attention Status Quo Bias model can explain both the finding that status quo bias is more prevalent in larger choice sets and that the introduction of a status quo can change choices between non-status quo alternatives. Existing models of status quo bias are inconsistent with the former finding while models of decision avoidance are inconsistent with the latter. We report the results of laboratory experiments which show that both attention and preference channels are necessary to explain the impact of status quo on choice.

Contracts 1

- **Campioni E. (University of Roma II, Tor Vergata)**
Multiple Principle Multiple Agent Games with Exclusive Competition

This paper deals with competing mechanisms games, in which contracts include exclusivity clauses.

- **Schlegel J.C (University of Lausanne)**
Contracts versus Salaries in Matching: A General Result

It is shown that a matching market with contracts may be embed-ded into a matching market with salaries under weaker conditions than substitutability of contracts. In particular, the result applies to the recently studied problem of cadet-to-branch matching. As an application of the embedding result, a new class of mechanisms for matching markets with contracts is designed that generalize the firm-proposing deferred acceptance algorithm to the case where contracts are unilateral substitutes for firms.

- **Bejan C. (University of Washington, Bothell)**
Performance-Based Contracts, Monitoring and Fraud

We characterize the optimal contract between the risk-neutral owner of a firm and its risk-averse manager, whose effort effects firm's (long-term) performance, and who can also manipulate short-term earnings reports to influence the stock price. We show that if the owner cannot commit to an auditing policy (which is ex-post suboptimal), the efficient contract involves a fixed wage for the manager and a grant of stock shares with a long vesting period. We also identify the conditions under which the contract is renegotiation-proof at the interim stage (before the true state of nature has been publicly revealed, but after the effort has been exerted).

Fairness, Allocation and Costs

- **Raghavan M. (Indian Statistical Institute)**
Fair Allocation with Exact Capacity Constraints

We consider situations where heterogeneous indivisible objects are to be distributed among a set of claimants based on preferences and priorities. We impose the additional restriction that each object has an exact capacity constraint, such that each object is assigned either to a pre-specified (fixed and common) number of agents, or it is not assigned at all. We demonstrate that the well-known incompatibility between fairness and Pareto efficiency in one-sided matching models persists in this model too. We propose a rule which we call the Deferred Acceptance with Improvements (DAI) rule, which is fair and constrained efficient. We also identify a Pareto improvement procedure that always leads us to a fair and constrained efficient allocation in one iteration. We show, however, that the DAI rule is not strategy-proof.

- **Zheng M. (University of Macau)**
Distributive Justice and the Threshold Level of Resource in the Fair Resource Allocation

A decision maker's subjective value judgment about distributive justice can be described by a representation function in the form of a Choquet integral. Using an additive representation of the Choquet integral, a decision maker's value judgment incorporates three widely discussed components in distributive justice: the decision maker's inequality aversion, her egalitarian consideration, and her perception of each recipient's deservingness. When the decision maker has an egalitarianism consideration, there is a threshold level of resource in the optimal resource allocation. The low deserving recipients obtain resources at the threshold level; whereas for other recipients, their allotted resources increase strictly with their deservingness. A more egalitarian decision maker sets a higher threshold level. This paper can provide a theoretical explanation for the existence of a threshold level in the resource allocations in the real world.

- **Hougaard J. L. (University of Copenhagen)**
Sharing the Cost of Risky Projects

Users share the cost of unreliable non rival projects (items). For instance they pay today for R&D that may deliver a cure to some viruses, they pay for the edges of a network that will cover their connectivity needs, but the edges may fail, and so on. Each user has a binary inelastic need that is served if and only if certain subsets of items are actually functioning. We ask how the cost should be divided ex ante when individual needs are heterogeneous. To reach a simple and transparent division method, we impose three powerful separability properties: Independence of Timing ensures neutrality w.r.t. additional information about the output of the projects. Cost Additivity together with Separability Across Items ensure that the cost shares of an item depend only upon the service provided by that item for a given realization of all other items. Combining these with fair bounds about the liability of agents with more or less .flexible needs, and of agents for whom an item is either indispensable or useless, we characterize two rules: the Ex-Post Service rule is the expectation of the equal division of costs between the agents who end up served; the Needs Priority rule splits the cost .First between those agents for whom an item is critical ex post, or if there are no such agents between those who end up being served. We submit as a reasonable family of rules the convex combinations of these two extreme approaches.

- **García A.S. (University of Granada)**
Fairness in Tax Compliance: A Political Competition Model

This paper analyzes the political economy of income redistribution when voters are concerned about fairness in tax compliance. We consider a two stage-model where there is a two-party competition over the tax rate and over the intensity of the tax enforcement policy in the first stage, and voters decide about their level of tax compliance in the second stage. We find that if the concern about fairness in tax compliance is high enough, a liberal middle-income majority of voters may block any income redistribution policy. Alternatively, we find an equilibrium in which the preferences of the median voter are ignored in favor of a coalition formed by a group of relatively poor voters and the richest voters. In this equilibrium income redistribution prevails with no tax enforcement.

Strategy-Proofness 2

- **Tierney R. (University of Rochester)**
Dense Manipulability of Efficient and Voluntary Exchange Rules

There is a divisible commodity and money. Each agent has an endowment of the two goods and continuous, monotone, convex preferences over bundles. Agents may benefit from trade. An exchange rule is a mapping that, for each profile of preferences, calculates for each agent a trade that he finds acceptable, given his preferences. It is known that no strategy-proof exchange rule always yields Pareto efficient out-comes. Strategy-proofness, however, is quite strong. We may instead ask the opposite question: if we insist upon Pareto efficiency, how frequently will the exchange rule be manipulable? We identify a large sub-domain, D, of economies on which any efficient exchange rule will be densely manipulable. The economies in D are those for which the Walrasian demand of agents would be interior. We find also that there are efficient exchange rules that are non-manipulable on open sets outside of D and thus our result cannot be extended to the entire domain.

- **Öztürk M. (MEF University, Istanbul)**
On the Location of Public Bads: Strategy-Proofness under Two-Dimensional Single-Dipped Preferences

In a model with finitely many agents who have single-dipped Euclidean preferences on a polytope in the Euclidean plane, a rule assigns to each profile of reported dips a point of the polytope. A point x of the polytope is called single-best if there is a point y of the polytope such that x is the unique point of the polytope at maximal distance from y .It is proved that if the polytope does not have either exactly two single-best points or exactly four single-best points which form the vertices of a rectangle, then any Pareto optimal and strategy-

proof rule is dictatorial. If the polytope has exactly two single-best points, then there are non-dictatorial strategy-proof and Pareto optimal rules, which can be described by committee voting (simple games) between the two single-best points. This also holds if there are exactly four single- best points which form the vertices of a rectangle, but in that case, we limit ourselves to describing an example of such a rule. The framework under consideration models situations where public bads such as garbage dumping grounds or nuclear plants have to be located within a confined region.

- **Zhou Y. (Osaka University)**
Strategy-Proofness and Efficiency for Common Object Ranking Preferences

We consider the allocation problem concerning the allocation of objects to agents and the determination of how much they should pay. Each agent at most receives one object and has the nonquasi-linear preference. The non-quasi-linear preference indicates that the individual payment for the object is huge, which may influence the agent's benefit derived from that object. The minimum price Walrasian rule is an allocation rule assigning a minimum price Walrasian equilibrium allocation to each preference profile. In this article, we mainly focus on the situation where agents have similar rankings over objects. First, we consider the case where at each payment level, agents have the common ranking over objects. Such a preference is called the "common object ranking preference". We show that on the common object ranking preference domain, an allocation rule satisfies Pareto efficiency, strategy-proofness, individual rationality and no subsidy if and only if it is the minimum price Walrasian rule. We further consider the same allocation problem on the tiered preference domain. The tiered preference means that at each payment level, agents have the common ranking over groups of objects, but for the objects within the same group, agents may have different rankings over them. Tiered preference domain is a subset of the classical preference domain and a superset of the common object ranking preference domain. We conclude that on the tiered preference domain, the minimum price Walrasian rule is the only allocation rule satisfying Pareto efficiency, strategy-proofness, individual rationality and no subsidy.

Reputation and Leadership

- **Brangewitz S. (University of Paderborn)**
Quality Choices and Reputation Systems in Online Markets – An Experimental Study

In internet transactions where customers and service providers often interact once and anonymously, a reputation system is particularly important to reduce information asymmetries about product quality. In this study we examine strategic quality choices of a service provider. Our study is motivated by a simple theoretical model where short-lived customers are asked to evaluate the observed quality of the service provider's product by providing ratings to a reputation system. A reputation profile informs about the ratings of the last three sales. This profile gives new customers an indicator for the quality they have to expect and determines the sales price of the product. From the theoretical model we derive that the service provider's dichotomous quality decisions are independent of the reputation profile and depend only on the probabilities of receiving positive and negative ratings when providing low or high quality. However, when mapping our theoretical model to an experimental design we find that a significant share of subjects in the role of the service provider deviates from optimal behavior and chooses actions which are conditional on the current reputation profile.

- **Doğan G. (University of Cologne)**
Leaders, Followers, and Group Decision-Making

Studies on leadership suggest leaders can be effective in setting a good example in public good and prisoner's dilemma games. It is however not clear whether these results extend to situations in which actions are clearly anti-social. The aim of the current study is finding out the effect of leaders when the choices of the leader are anti-social. In a series of experiments, I explore the following: (i) Do followers shift moral responsibility to the leader, and therefore follow an anti-social decision which they would not initiate, (ii) Do leaders shift moral responsibility to the followers, and therefore initiate an anti-social act when there are followers more often than when there are no followers (iii) Is there responsibility shifting to the group decision-making such that the anti-social action is chosen more often under unanimity than when everyone is individually responsible for their own actions. To answer these questions, I use the one-shot mobbing game in which three players have to coordinate on the fourth to redistribute that person's earnings among themselves. The leader solves the coordination problem. By varying the decision-making mechanism, I find the following: Followers engage in anti-social actions more often than leaders, but, surprisingly, group decision-making results in overall more equal outcomes than individual decisions. There is no effect of followers on the leader's decisions. The results cannot be explained by image concerns.

- **Kubilay E. (Koç University)**
  Leadership and Group Decision-Making under Risk: Evidence from Children

In this paper, we document the factors associated with the willingness to become a leader and study how this willingness evolves over time within the context of decisions made on behalf of a group under risk in a large sample of children and adolescents in Turkey. We use an experimental design that allows us to measure (1) individual risk-taking, (2) willingness to make decisions on behalf the group (leadership) and, (3) risk-taking on behalf of the group. We couple this with an auxiliary real-effort task designed to measure self-confidence. Our findings suggest that overall, children are less willing to become leaders in middle school, compared to elementary school. While there is no gender difference in leadership willingness in elementary schools, a significant difference emerges in middle schools, with girls becoming less willing to be leaders than boys. We find that for young girls, willingness to be a leader is positively correlated with several factors such as risk tolerance, popularity and self-confidence. In young boys, however, only single measure of confidence (public confidence) affects leadership decision, making it seem almost an independent trait. As boys reach adolescence, however, actual grades and risk tolerance emerge as significant correlates of leadership.

- **Oljemark E. (University of Konstanz)**
  Reputation and the Value of Information in a Trust Game

I analyze a twice-repeated trust game where an Investor chooses in each period whether to invest or not in a project carried out by an Entrepreneur. The value of the project is fixed through time and is either common knowledge, or private knowledge of the entrepreneur. The Investor learns about the reliability of the entrepreneur by observing whether he repays investments or not. If the project is valuable enough an unreliable Entrepreneur invests in reputation in order to obtain financing also in the second round. There is shown to always exist parameter environments under which ex-ante welfare is maximized for each player if the Entrepreneur is privately informed about the value of his project.

Social Choice 1 (Organized By Peters H.)

- **Alcalde-Unzu, J. (University of Navarra)**
  Strategy-Proof Location of Public Facilities

Agents frequently have different opinions on the decision of where to locate a public facility: while some agents may prefer to have it closer to them, others may prefer to have it far away. To aggregate agents'

preferences in these cases, we propose a new domain of preferences in which agents may have single-peaked or single-dipped preferences on the location of the facility, but such that the peak or dip is situated in the location of the agent. We characterize all strategy-proof rules in this domain and we show that all these rules are also group strategy- proof. Therefore, we show that, in this domain, we can escape from the classical impossibility result of Gibbard-Satterthwaite with meaningful rules.

- **Can B. (Maastricht University)**
How To Compare Orders, Rankings, Queues, Lists?

We study measures on orders that are based on the swaps needed to convert one order into the other. Two classes of such measures are characterized. In one class, positions of the necessary swaps between orders are weighted. In the other class, the pairs of alternatives involved in these swaps are weighted. The results are realized by means of the betweenness condition and several other natural or well-known derivates. As the axioms are formulated on abstract domains of orders, they apply to apply to all well-known sets of orderings. As a by-product we also show some logical dependencies in the well-established characterization result in Kemeny (1959)

- **Storcken T. (Maastricht University)**
A Monotonicity Condition for Preference Correspondences

Here we focus on characterizing collective decision rules on the basis of up-date monotonicity. A condition which implies that an outcome remains chosen if individual preferences change towards it. A stronger variation of this condition additionally requires that no new possible outcomes are chosen. Several well-known collective decision rules satisfy this condition. Moreover, at some it appears as one of the characterizing axioms. This is the case at for instance the Kemeny preference correspondence and at majority judgment aggregation. It is therefore worthwhile trying to characterize Slater's collective preference correspondence using this condition. We present several of such characterizations for Slater's rule.

- **Peters H. (Maastricht University)**
Choosing k from m: Feasible Elimination Procedures Reconsidered

We show that feasible elimination procedures (Peleg, 1978) can be used to select k from m alternatives. An important advantage of this method is the core property: no coalition can guarantee an outcome that is preferred by all its members. We also provide an axiomatic characterization for the case k= 1, using the conditions of anonymity, Masking monotonicity, and independent blocking. Finally, we show for any k that outcomes of feasible elimination procedures can be computed in polynomial time, by showing that the problem is computationally equivalent to finding a maximal matching in a bipartite graph.

Parallel Sessions July 4 (14.00 -16.00)

Coalition Formation and Hedonic Games

- **Karakaya M. (İzmir Kâtip Çelebi University)**
Hedonic Coalition Formation Games with Variable Populations: Core Characterizations and (Im) Possibilities

We consider hedonic coalition formation games with variable sets of agents and extend the properties competition sensitivity and resource sensitivity (introduced by Klaus, 2011, for roommate markets) to hedonic coalition formation games. Then, we show that on the domain of solvable hedonic coalition formation games, the Core is characterized by coalitional unanimity and Maskin monotonicity (see also Takamiya, 2010, Theorem 1). Next, we characterize the Core for solvable hedonic coalition formation games by unanimity, Maskin monotonicity, and either competition sensitivity or resource sensitivity (Corollary 2). Finally, and in contrast to roommate markets, we show that on the domain of solvable hedonic coalition formation games, there exists a solution not equal to the Core that satisfies coalitional unanimity, consistency, competition sensitivity, and resource sensitivity (Example 2).

- **Lazarova E. (Universtiy of East Anglia)**
Inducing Stability in Hedonic Games

In many applications of coalition formation games, a key issue is that some desirable coalition structures are not elements of the core of these games. In these cases, it would be useful for an authority which aims to implement a certain outcome to know how far from the original game is the nearest game where the desirable outcome is part of the core. This question is at the center of this study. Focusing on hedonic games, we uncover previously unexplored links between such games and transferrable utility games and develop a tailor-made solution concept for the transferrable utility game, *the implementation core*, to provide an answer to our question.

- **İnal H. (İzmir University)**
Existence of a Unique Core in Coalition Formation Games

In coalition formation games with arbitrary collection of permissible coalitions, a condition on preference profiles, weaker than those in Pycia (2012) when preferences are strict, is sufficient for the existence of a unique core partition. An algorithm is presented for finding the unique core partition when preference profiles satisfy that condition. The algorithm terminates after a finite number of iterations bounded by the number of agents.

- **Siegenthaler S. (New York University Abu Dhabi)**
Gradual Coalition Formation with Externalities

We study coalition formation in environments with irreversible actions and externalities. Although binding agreements can be written, efficiency is not guaranteed, because the incentives to increase bargaining power may not be in line with the socially efficient action. It is shown that the prospects of efficiency depend i) on the degree to which players can renegotiate and gradually build up agreements and ii) the absence of a certain type of externalities which can be interpreted as free riding opportunities. For characteristic function games, we find that the grand coalition always forms if renegotiation is possible and otherwise forms if and only if the interior of the Core is non-empty. We explore two mechanisms that help to overcome inefficiencies in environments with free riding incentives. On the one hand, the willingness to concede bargaining power is

identified as a novel reason for gradualism. On the other hand, we assess the amount of additional external resources needed to restore efficiency.

Social Interaction

- **Exadaktylos F. (Middlesex University London)**
Civic Attitudes, Social Capital and Institutions: a multi-level analysis across 47 European countries

The study focuses on the mediating role of the Quality of Governance on the effect that Social Capital (SC) has on the civic attitudes of citizens (tax compliance for instance). Using the 2008 wave of the European Values Survey and the Quality of Governance Index (QoG), we present both micro and macro evidence of a differential effect; in countries of the European North and the Nordic Countries, which enjoy a high level of QoG, SC has a positive effect on the civic attitudes. In sharp contrast, in countries of the South, Central and East Europe, scoring low in the QoG, the relationship is reversed: SC affects negatively the civicness level. We provide evidence that QoG mediates the relationship. However, we reveal that the negative effect of SC is restricted only to those attitudes that require the involvement of the formal institutions in order to be realized as truly civic. SC is positively correlated with civic behaviours that are operating outside the formal channels across all countries.

- **Hilleringmann V. (University of Paderborn)**
Corruption in the Physician-Patient Relationship – The Influence of Reciprocity

This paper shows how reciprocity can be used to explain a physician's corrupt behavior. A theoretical model is developed that applies economic behavioral models to the physician's therapy decision. Focusing on the physician-patient relationship, this paper studies reasons for a physician to be corrupt. Cases in which a physician implicitly agrees to a corrupt act and prescribes a non-optimal therapy are analyzed. A rational or altruistic physician will not act in a corrupt way. The key for explaining corruption in the physician-patient relationship is a reciprocal behavior by the physician

- **Erol S. (University of Pennsylvania)**
Network formation and Systemic Risk

This paper introduces a model of endogenous network formation and systemic risk. In it, strategic agents form networks that efficiently trade-off the possibility of systemic risk with the benefits of trade. Efficiency is a consequence of the high risk of contagion which forces agents to endogenize their externalities. Second, fundamentally 'safer' economies generate much higher interconnectedness, which in turn leads to higher systemic risk. Third, the structure of the network formed depends crucially on whether the shocks to the system are believed to be correlated or independent of each other. This underlines the importance of specifying the shock structure before investigating a given network as a particular network and shock structure could be incompatible.

- **Bjerre-Nielsen A. (University of Copenhagen)**
Centrality, stratification and adverse effects: network formation with value heterogeneity

I model networks of multilateral partnerships where indirect relations may affect payoff, e.g., friends of friends are valuable. Agents are heterogeneous in value they contribute to forming a link. I provide sufficient conditions for assortative matching: agents of greater talent have partners of greater talent. A novel feature is that agents with higher talent are more central in networks. Another novel feature is degree assortativity:

partnered agents have a similar number of partners. Two suboptimal network structures are noteworthy. One network displays excess assortativity as high and low talented types fail to connect, and thus inefficient due to payoff externalities despite otherwise obeying the conditions of Becker (1973). In another suboptimal network an agent of low talent becomes excessively central.

Social Choice and Voting

- **Dindar H. (İstanbul Bilgi University)**

Vote Swapping in Representative Democracy

We investigate a specific type of group coalitional manipulation in two-tiers elections, where groups of voters manipulate by exchanging votes. Two-tiers elections are modeled as a two-stage choice procedure where in the first stage voters are distributed into districts, each being assigned one delegate. Delegates' preferences result from aggregating voters' preferences district-wise by means of some aggregation rule. Final outcomes are subsets of alternatives obtained at the second stage by applying some social choice function to delegate profiles. Combining an aggregation rule and a social choice function defines a constitution. Voters' preferences are linear orders over alternatives, which are extended to partial orders over sets by means of either the Kelly or the Fishburn extension rule. A constitution is Kelly (resp., Fishburn) swapping-proof if no group of voters can get by exchanging their preferences a jointly preferred outcome according to the Kelly (resp. Fishburn) extension. We establish sufficient conditions for swapping-proofness. Special attention is paid to Condorcet (resp., positional) constitutions, where both the aggregation rule and the social choice function are based on simple majority voting (resp., a score vector). We characterize Kelly and Fishburn swapping-proof Condorcet constitutions, and show that no positional constitution is Kelly or Fishburn swapping proof.

- **Jeong H. (Seoul National University)**

Resolute Majority Rules

In many auctions, because of externalities, each bidder has a different maximum willingness to pay in order to beat each specific competitor, which causes the following new problem. When there are three bidders, two bidders might compete against each other unnecessarily and have worse payoffs than if they had lost to the third bidder, i.e., the two bidders have "group winner regret," which can also lead to inefficiency. While no one-dimensional-bid mechanism is efficient, the Vickrey-Clarke-Groves may require losers to pay. This paper introduces a novel mechanism, the "multidimensional second-price" (MSP) auction (and its open ascending version), and characterizes it. MSP is free of a loser's payment, pairwise stable, and has good incentive properties, including no group winner regret. Moreover, the winner cannot win at any different price by any misreport, and a loser cannot be better off winning by any misreport. MSP is strategyproof for a bidder without externalities imposed by others, and it reduces to the second-price auction when there are no externalities. Simulations suggest that MSP outperforms the second-price auction in terms of both revenue and efficiency.

- **Chen Y. (Johns Hopkins University)**

Dynamic Agenda Setting

A party in power can address only a limited number of issues in an election cycle. What issues to address - the party's agenda - has dynamic implications because it affects what issues will be addressed in the future. What is the optimal agenda in the presence of dynamic concerns? How do bargaining rules affect the agenda? What are the efficiency implications? We address these questions in a stylized model in which the incumbent in any period addresses one issue among several issues and the remaining issues roll over to the next period. We show that distortions can happen in the form of *preemption* or *steering*. In preemption, the incumbent gives priority to the issue that is most pressing for the opposition party to prevent the opposition from addressing it if the opposition comes in power. In steering, the incumbent gives priority to a less pressing issue to direct the opposition party's agenda towards addressing the most pressing issue for the incumbent. Although preemption can still be efficient, steering is necessarily inefficient. We show that steering happens only when the polarization between the parties is not too high. Furthermore, under partisan

preferences, steering does not take place under majority rule, but is possible under unanimity and supermajority.

- **Sarpca S. (Koç University)**
Majority Choice of an Income Targeted Educational Voucher

This paper develops a positive model of majority choice that can explain the common features of voucher programs currently operating in the U.S. Adopting the representative democracy model of Besley and Coate (1997), the analysis incorporates endogenous public choice of the voucher amount, the income threshold for eligibility, expenditure per student in public schools, and the tax needed to finance public expenditures. With realistic parameter restrictions equilibrium has a majority attending public school and an income-targeted voucher of magnitude below per student public expenditure.   The income threshold to qualify for the voucher is determined so that no rich students that would attend private school without a voucher qualify for a voucher. The political equilibrium shares the "ends against the middle" property of the voting coalitions in Epple and Romano's (1996) analysis of majority choice of public educational expenditure.

School Choice 2

- **Jaramillo P. (University of Los Andes)**
Transparency in School Choice

In the U.S., the school choice mechanisms used to assign students to schools are fully transparent whereas in Colombia they are not. We want to know whether full transparency is better than partial transparency or no transparency at all. We consider a school choice problem in which there is no full transparency. We are interested in rules recommending a deterministic assignment and rules recommending a probability distribution over matchings. Hence, we analyze Nash equilibrium and Bayesian Nash equilibrium of the games associated with these rules. We check the properties of the outcomes of the equilibrium.

- **Chen L. (Université libre de Bruxelles)**
Self-Selection in School Choice: Theory and Evidence from Mexico City High School Match

This paper studies self-selection in centralized school choice, a process by which students decide not to apply to some schools even if they view them as desirable. It is motivated by the Mexico City high school match, where students submit preferences before knowing their priorities at schools. We give a theoretical explanation for self-selection: if a student believes her chances of being assigned to some schools are zero, then she may skip them even when the mechanism in place is strategy-proof. Using data, we present evidence that self-selection exists, and has negative consequences. First, students from low socio-economic background are more likely to self-select. Second, once the uncertainty is resolved, some students who finally get a high priority are not assigned to their most preferred choice because of self-selection; and again, this happens more often to students of low socio-economic background. These findings challenge the idea that school choice provides equal access, and questions the current design of timing when submitting preferences.

- **Kurino M. (University of Tsukuba)**
College Admissions with Entrance Exams: Centralized versus Decentralized

We theoretically and experimentally study a college admissions problem in which colleges accept students by ranking students' efforts in entrance exams. Students' ability levels affect the cost of their efforts. We solve and compare equilibria of "centralized college admissions" (CCA) where students apply to all colleges, and "decentralized college admissions" (DCA) where students only apply to one college. We show that lower ability students prefer DCA whereas higher ability students prefer CCA. The main predictions of the theory are supported by experiments, yet we find a number of differences that render DCA less attractive than CCA compared to equilibrium benchmark.

- **Van der Linden M. (Vanderbilt University)**
A New Method to Compare Manipulable Mechanisms, with Applications to School Choice

We introduce a new criterion to compare the properties of manipulable mechanisms, in the spirit of Pathak and Sönmez (2013). We use this criterion to compare the relative stability of constrained versions of the Boston (BOS) and Deferred Acceptance (DA) mechanism, in which students can only rank a subset of the schools they could potentially access Haeringer and Klijn (2009). We find that in DA, when students have complete information on each other's preferences and play a Nash-equilibrium, there is a stability cost to increasing the number of schools students can rank. On the other hand, when students have little information and only play undominated strategies, increasing the number of schools students can rank increases stability. Similar results are found for BOS. We also compare BOS and DA. Whatever the number of schools students can rank, we find that BOS is more stable than DA in Nash-equilibrium, but less stable in undominated strategies.

Matching and Contracts

- **Alva S. (University of Texas at San Antonio)**
Pairwise Stability and Complementarity in Matching With Contracts

Complementarity has proved to be a challenge for many-to-one matching theory, because the core and group stable matchings may fail to exist. Less well understood is the more basic notion of pairwise stability. I define a class of complementarity, asymmetric complements, and show that pairwise stable matchings are guaranteed to exist in matching markets where no firm considers workers to be asymmetric complements. The lattice structure of the pairwise stable matchings, familiar from the matching theory with substitutes, does not survive in this more general domain. The simultaneous-offer and sequential-offer versions of the worker-proposing deferred acceptance algorithm can produce different matchings when workers are not necessarily substitutable. If no firm considers workers to be imperfect complements, then the simultaneous-offer version produces a pairwise stable matching, but this is not necessarily true otherwise. If no firm considers workers to be asymmetric complements, a weaker restriction than no imperfect complements, then the sequential-offer version produces a pairwise stable matching, though the matching produced is order-dependent.

- **Afacan M. O. (Sabancı University)**
Graduate Admission with Financial Support

We formulate graduate admission with financial support as a matching with contract problem. The current decentralized system entails some severe problems, such as unstability and unfairness. To fi x this, we propose a centralized market design. We first introduce "Admission with Financial Support" (AwFS) choices for departments. They satisfy certain constraints departments encounter in offering graduate admissions with different types of financial supports. We then propose a cumulative offer process (COP) under AwFS choices. The COP under AwFS choices produces stable outcomes. Furthermore, it is fair and strategy-proof. Lastly, we show that no student is worse off as a result of his ranking improvement under our proposal, that is, the COP under AwFS choices respects improvements. These results advocate replacing the current graduate admission system with the proposed one.

- **Turhan B. (Boston College)**
Dynamic Reserves in Matching Markets with Contracts: Theory and Applications

Indian Engineering school admissions, which draws more than 300,000 applications per year, suffers from an important market failure: Through their affirmative action program certain number of seats are reserved for different under-privileged groups (lower castes and tribes). However, when some of these seats are unfilled they are not offered to other groups, and the system is vastly wasteful. Moreover, since students care not only about the institution they are assigned to but also whether they are assigned through reserves or not, they may strategically manipulate the system by both not revealing their privilege type and changing their preferences over institutions. In this paper, we propose a new matching model with contracts with the ability to release

vacant seats to the use of other students by respecting certain affirmative action objectives. We design a new choice function for schools that respects affirmative action objectives, avoids waste, and increases efficiency. We propose a mechanism that is stable, strategy proof, and respects test score improvements with respect to these choice functions. Moreover, this model has other direct applications in cadet-branch matching and assignment procedures in hierarchical institutions.

- **Westkamp A. (Maastricht University)**
Strategy-Proofness and Stability for Matching with Contracts

We consider the setting of many-to-one matching with contracts, where firms may demand multiple contracts but each worker desires at most one contract. We introduce three novel conditions—observable substitutability, observable size monotonicity, and non-manipulatability—and show that when these conditions are satisfied, a stable and strategy-proof (for workers) mechanism exists. Moreover, when any of our three conditions fails, one may construct preferences for the doctors and unit-demand choice functions for the other firms such that no stable and strategy-proof mechanism exists. We also establish that, whenever our three conditions are satisfied, the cumulative offer mechanism is independent of the order of proposals and is the unique stable and strategy-proof mechanism. In the final part of the paper, we characterize the class of choice functions for which the cumulative offer mechanism is guaranteed to yield a stable outcome. By means of an example, we show that there are situations in which the cumulative offer mechanism may fail to produce a stable outcome even though stable outcomes are guaranteed to exist.

Game Theory 2 (Organized By Peters H.)

- **Keskin K. (Bilkent University)**
Organizational Refinements of Nash Equilibrium

Strong Nash equilibrium (Aumann, 1959) and coalition-proof Nash equilibrium (Bernheim et al., 1987) are two well-known coalitional refinements of Nash equilibrium. These refinements rely on the idea that agents are allowed to form coalitions in order to make joint deviations. They both consider a case in which any coalition can be formed. Be that as it may, there are many real-life examples where some coalitions/subcoalitions cannot be formed. Possible reasons are history of bad relations, lack of communication, and rules or regulations. Furthermore, if all coalitions are formed, then there occur conflicts of interest such that an agent cannot choose an action that simultaneously meets the requirements of two coalitions s/he is a member of. Stemming from these criticisms, we study a so-called organizational framework where some coalitions/subcoalitions cannot be formed and where the coalitional structure are formulated in such a way that there remain no conflicts of interest. We define an organization as an ordered collection of partitions of the set of agents in such a way that any partition is coarser than the partitions that precede it. For a given organization, we propose two refinements of Nash equilibrium: organizational Nash equilibrium (ONE) and weighted organizational Nash equilibrium (WONE). We show that ONE is weaker than strong Nash equilibrium and prove the existence of WONE for a subset of supermodular games. We then provide illustrative examples which help us understand how these notions of equilibrium refine the set of Nash equilibria.

- **Schröder M. (Maastricht University)**
Waiting in the Queue on Hotelling's Main Street

The seminal paper of Hotelling (1929) describes a simple model of spatial competition: firms compete for consumers by means of location on an interval. Kohlberg (1983) proposes a natural modification in which consumers care about the travel time as well as the waiting time for service. His claim is that there are no equilibria for more than two symmetric firms. We reconsider the model and obtain the following results. First, we provide several examples to show existence of equilibria for more than two symmetric firms. The equilibrium locations of the firms are different from the equilibrium locations in the original model. Second, an intriguing aspect of Hotelling's original model is the lack of an equilibrium if three firms compete in location. We provide a condition under which an equilibrium exists if we allow the three firms to be asymmetric.

- **Vermeulen D. (Maastricht University)**
On Pure-Strategy Nash Equilibria in Price-Quantity Games

A classic and persistent problem in the history of economic thought is how prices and quantities are determined in industries comprising only a few firms. One well-known puzzle in oligopoly theory concerns the non-existence of (pure-strategy) Nash equilibrium under the plausible assumption of firms choosing both their prices and levels of production. This paper re-examines price-quantity competition in oligopolies. In contrast with previous work, we provide sufficient conditions for the existence of a pure-strategy Nash equilibrium. Specifically, we show that the problem of existence critically depends on assumptions regarding the buyers' side of the market. Moreover, and under fairly weak assumptions, these pure-strategy solutions can be characterized explicitly. If goods are differentiated, then the equilibrium outcome is similar to the one predicted by standard models of price competition. If goods are perfect substitutes, then two types of purestrategy equilibria exist. First, there is a range of rationing equilibria (i.e., pure-strategy equilibria in which production falls short of market demand). Second, and akin to the differentiated good case, there is again an equilibrium resembling the solution of a basic price competition model. Thus, in both cases we find that price-quantity competition yield Bertrand outcomes. Our study therefore not only provides a solution to the oligopoly problem, but also gives a justification for the use of models in which producers compete on the basis of price alone.

- **Zseleva A. (Maastricht University)**
OptimalFinitely Additive Strategies in Zero-Sum Games

We consider two-player zero-sum games with uncountable action spaces and bounded payoff functions. The players' strategies are finitely additive probability measures, called charges. Since a strategy profile does not always induce a unique expected payoff, we distinguish two extreme attitudes of players. A player is viewed as pessimistic if he always evaluates the range of possible expected payoffs by the worst one, and a player is viewed as optimistic if he always evaluates it by the best one. This approach results in a definition of a pessimistic and an optimistic value for each player. We provide an extensive analysis of the relation between these values, and connect them to the classical values. In addition, we also examine existence of optimal strategies with respect to these values

Optimal Pricing and Auctions (Organized By Bergemann D.)

- **Lamba R. (Cambridge University)**
Efficiency with(out) Intermediation in Repeated Bargaining

This paper analyzes repeated version of the bargaining model with two sided asymmetric information where the payoff relevant private information of both the buyer and the seller is correlated across time. Using this setup it makes the following three contributions. First, it derives necessary and sufficient conditions on the primitives of the model as to when efficiency can be attained under ex post budget balance and participation constraints. Second, in doing so, it introduces an intermediate notion of budget balance called interim budget balance that allows for the extension of credit lines but with participation constraints for the issuing authority. Third, it provides a foundation for the role of an intermediary in a dynamic mechanism design model under credit constraints.

- **Baisa B. (C (Amherst College)**
A Detail-Free and Efficient Auction for Budget Constrained Bidders

Consider an auction for a divisible good where bidders have private budgets. Recent work by Dobzinski, Lavi, and Nisan (2012) shows there is no individually rational dominant strategy mechanism that implements a Pareto efficient outcome and satisfies weak budget balance when bidders have private budgets. My main result

shows that when bidders have full-support beliefs over their rivals' types, a clinching auction played by proxy-bidders implements a Pareto efficient out- come. The auction is not dominant strategy implementable, but it can be solved using two rounds of iterative deletion of weakly dominated strategies. The predictions do not require that bidders share a common prior and they place no restrictions on higher-order beliefs. The results are also extended to the sale of an indivisible good.

- **Farinha Luz V. (EUI and University of British Columbia)**
Robust dynamic pricing

In this paper, we characterize the optimal pricing schedule for a firm that interacts with a single buyer for several periods. It is assumed that the buyer learns (costlessly) about his type over time, but the information acquisition technology is unknown to the seller. In the face of this ambiguity, the seller considers the worst-case scenario regarding the induced type distribution. In the first part of the analysis, we solve a revenue maximization problem with ex-post incentive constraints. In this problem, the choice set of the seller is prior-independent. This simplifies the analysis and allows us to find the optimal revenue by solving a zero-sum game between the seller and nature. The optimal mechanism is the repetition of a static pricing scheme that is independent of the number of periods. In the second part of the paper, we show that the revenue maximization problems with interim and ex-post incentive constraints have the same solution. The set of interim incentive compatible mechanisms is strictly larger than the set of ex-post incentive compatible mechanisms and depends on the actual type distribution. However, it is shown that the seller can use the optimal ex-post incentive compatible mechanism without loss of revenue.

Parallel Sessions July 4 (16.30-18.00)

Risk and Uncertainty

- **Omrane W.B. (Goodman School of Business at Brock University)**

Exchange Rate Volatility Response to Macroeconomic news during Economic Expansions and Recessions

We examine the state-dependent volatility reaction to macroeconomic news in the euro-dollar, pound-dollar and yen-dollar markets during the 2005-2009 period. Unlike the traditional event studies that define economic states based on exogenously determined thresholds, we employ the smooth transition regression model, which allows for the possibility of a gradual as well as an instantaneous regime change. Our results suggest that, for about 40 percent of the major news categories, the volatility reaction to macroeconomic news is larger in expansions compared to recessions in the three major currency markets. Non-farm payroll employment, GDP advance release, retail sales, trade deficit and CPI announcements are consistently associated with larger volatility response in expansions. New home sales and the Fed funds rate announcements, on the other hand, generate larger market reactions in recession periods. We attribute the pattern associated with new home sales and the Fed funds rate to the unique role the real estate and credit markets played in the 2008 recession. We show that different types of macroeconomic news indicators generate different shapes of transition functions. Specifically, the estimated transition function based on the housing starts data indicates a more gradual and earlier regime change compared to other indicators.

- **Shafer R.C. (University of Illinois)**

The Axiom of Symmetry and Failure of Convergence to Price-Taking under Knightian Uncertainty

We consider whether competitive pressures can induce traders to truthfully report their private redemption valuations under Knightian uncertainty. Traders face Knightian uncertainty if they know the possible outcomes of each available action, but do not know each outcome's probability. Such uncertainty may motivate use of a decision rule other than expected utility maximization. Two such alternative decision rules are maxmin and minimax regret. An axiomatic characterization of these decision rules reveals that there is one axiom that maxmin and minimax regret share, and that distinguishes them from Bayes rule: the axiom of symmetry. We find that if agents in a private-value k-double auction use decision rules that accord with the symmetry axiom, then their bids and asks will not depend on the number of rival traders. Consequently, a market populated by traders that follow the symmetry axiom will not converge to efficiency as the market grows.

Contracts 2

- **Gretschko V. (University of Cologne)**

Common Values and the Coase Conjecture: Inefficiencies in Frictionless Contract (Re-) Negotiation

We consider the contracting problem of a principal who faces an agent with private information and cannot commit to not renegotiate a chosen contract. To analyze this problem, we propose an infinite horizon negotiation protocol in which renegotiation is frictionless, executed without delay and there are no restrictions on how many times the contracts can be renegotiated. We provide a general characterization of renegotiation-proof outcomes and show that those outcomes are supported by a Perfect Bayesian Equilibrium of the negotiation game. The general characterization of renegotiation-proof outcomes provides a powerful and simple to use tool for finding such outcomes in specific environments. Thus, we proceed by applying the results to adverse selection environments with private and common values. We show that with private values and

common values of the 'Spence' type only fully efficient and separating contracts can be renegotiation proof. However, with common values of the 'Rothschild-Stiglitz' type inefficient and (partial) pooling contracts may constitute renegotiation-proof outcomes.

- **Koçkesen L. (Koç University)**
Optimal Delegation of Sequential Decisions: The Role of Communication and Reputation

We characterize the optimal delegation of a set of decisions over time by an informed principal. The principal and the agent might have a conflict of interest, i.e., the agent might be biased, and whether this is the case is the agent's private information. Each period a state of the world is realized and observed only by the principal. He sends a report about the state of the world to the agent, who then takes an action on the decision assigned in that period. We assume that the communication by the principal is cheap-talk and the state of the world and the actions are not contractible. In equilibrium, the principal assigns less important decisions at the beginning and increases the importance of the decisions towards the end. At the beginning of their relationship, the biased agent acts exactly in accordance with the principal's preferences, while towards the end, she starts playing her own favorite action with positive probability and gradually builds up her reputation. Principal provides full information in every period as long as he has always observed his favorite actions in the past. If we interpret the sequence of decisions as the career path of an agent, this finding fits the casual observation that an agent's career usually progresses by making more and more important decisions and provides a novel explanation for why this is optimal.

- **Montinari N. (University of Lund)**
Back Scratching in Hierarchical Organizations

Reciprocity concerns have been widely emphasized as a positive characteristic of workers in organizations, where members' interests are misaligned. We investigate the emergence of implicit collusive agreements in hierarchical organizations that only benefits some members while damaging the overall organization. We conduct a laboratory experiment in which an agent has to hire, on behalf of the principal, one worker out of two candidates. The two candidates differ in their ability and, once employed, the selected one decides which level of costly non-contractible effort to exert in two activities: one benefits the organization while the other one is less productive and only benefits the agent. We provide evidence that: i) low ability workers are more likely to exert effort in the inefficient activity that provides benefits solely to agents; ii) as a consequence, agents distort the hiring process in their favor and iii) sharing a small part of the organization's profits with the workers alleviates effort distortion.

Choice 2

- **Çuhadaroğlu T. (University of St. Andrews)**
Choosing on Influence

We present Choice on Mutual Influence as a simple and intuitive decision mechanism for interacting individuals, where interaction simply occurs to enable individuals refine their choices. The baseline model considers two individuals that acquire influence from each other, whenever they cannot decide on their own. We show that this procedure is characterized by three falsifiable behavioral properties on the choice data of individuals. Our characterization result grants not only the underlying preferences but also the revealed influence.

- **Kübler D. (Social Science Research Center Berlin & Technical University Berlin)**
Flipping a Coin: Theory and Evidence

We investigate the possibility that a decision-maker prefers to avoid making a decision and instead delegates it to an external device, e.g., a coin flip. In a series of experiments the participants often choose lotteries

between allocations, which contradicts most theories of choice such as expected utility but is consistent with a theory of responsibility aversion that implies a preference for randomness. A large data set on university applications in Germany shows a choice pattern that is also consistent with this theory and entails substantial allocative consequences.

- **Güney B. (Özyeğin University)**
Choice with Switching Costs

We propose a theory of status quo-dependent choice that we first axiomatically characterize and then apply to game theoretic settings. According to our theory, when the agent has no status quo, he simply chooses the alternative that maximizes his utility. Hence, our theory reduces to the standard theory in the absence of a status quo. On the other hand, when the agent is endowed with a status quo, moving away from it leads the agent to incur a switching cost that can vary depending upon which alternative the agent switches to and from. As a result, in a choice problem with a status quo, the agent chooses the available alternative whose utility net of the switching cost is the highest. Our theory not only generates the status quo bias phenomenon but also allows for the status quo to yield a graded reference effect, in addition to the 0/1 type of reference effect modeled in the literature. In our applications, we extend the notion of Nash Equilibrium to incorporate switching costs into the standard game theoretic setting.

Mechanism Design 4

- **Csóka E. (University of Warwick)**
Efficient Teamwork

We model multi-agent projects where each agent has a private workow including hidden actions and chance events, which can inuence each other through publicly observable actions and events. We design an effcient and prior-independent mechanism for this novel environment which is quasi-dominant strategy incentive-compatible, collusion-resistant, individually rational and avoids free-riders.

- **Herbst H. (University of Bonn)**
Pricing Heterogeneous Goods under Ex Post Private Information

This paper studies the role of exchange policies as a price discrimination device in a sequential screening model with heterogeneous goods. In the first period, agents are uncertain about their ordinal preferences over a set of horizontally differentiated goods, but have private information about their intensity of preferences. In the second period, each individual privately learns his preferences and consumption takes place. Revenue maximizing mechanisms are completely characterized. They partially restrict the flexibility between the goods in the second stage for consumers that care little about which variety they obtain while granting always the favorite good to consumers that care much. The optimal design of the partial restriction of flexibility can be implemented by offering Limited Exchange Contracts. A Limited Exchange Contract consists of an initial product choice and a subset of products to which free exchange is possible in the second period. The use of exchange fees in contracts is not optimal for the purpose of price discrimination.

- **Howard J. V. (London School of Economics)**
Exchanging Goods Using Valuable Money

A group of people wishes to use money to exchange goods efficiently over several time periods. However, there are disadvantages to using any of the goods as money, and in addition fiat money issued in the form of notes or coins will be valueless in the final time period and hence in all earlier periods. Also, Walrasian market prices are determined only up to an arbitrary rescaling. Nevertheless we show that it is possible to devise a

system which uses money to exchange goods and in which money has a unique positive value. The mechanism controls the flow rather than the stock of money: it introduces some trading frictions, some redistribution of wealth, and some distortion of prices, but these effects can all be made small.

Matching 5

- **Heller C. P. (Humboldt University)**
Matching with Waiting Times: The German Entry-Level Labour Market for Lawyers

We study the allocation of German lawyers to different regional courts for their compulsory legal traineeship. The number of applicants exceeds the number of available positions in a given time period in some regions, so that not all lawyers can be matched simultaneously. As a consequence some lawyers have to wait before they obtain a position. First, we analyse the currently used Berlin mechanism and demonstrate that it is unfair and that it does not respect improvements. Second, we introduce a matching with contracts model, using waiting time as the contractual term, for which we suggest an appropriate choice function for the courts that respects the capacity constraints of each court for each period. Despite the failure of the unilateral substitutes condition, under a weak assumption on lawyers' preferences, a lawyer-optimal stable allocation exists. Using existing results, we can show that the resulting mechanism is strategy-proof, fair and respects improvements. Third, we extend our proposed mechanism to allow for a more flexible allocation of positions over time.

- **Smilgins A. (University of Copenhagen)**
Two-Sided Matching with Objects

In 1962 Gale and Shapley considered a two-sided stable matching problem. Later many-sided matching problems were studied, and in contrast to the original two-sided problem, a stable matching may not exist. In this paper we extend the classical model by including a non-empty set of objects, such that a matching includes two agents from disjoint sets, denoted by men and women, and an object. We assume that the three sets have equal cardinality. Each man has strict preferences over woman-object pairs, each woman has preferences over man-object pairs, while objects have no preferences. This model is different from a three-sided matching problem in that objects have no preferences and thus can't block, i.e. can't prefer one man-woman couple to another. This model has several real life applications, for instance assigning two-room apartments to local and international students such that a local student shares a room with an international student. Every agent has to keep in mind that a certain object may make him more or less attractive to the agents from the other set.
We extend the definition of a blocking pair to capture the setup of our model, and show that when both men and women have the right to choose the object, a stable matching may not exist. However, when only one set of agents has the right to choose the objects, there will always be at least one stable matching.
We introduce a new fairness property, "No advantageous reallocation" that ensures that the assignment of the objects is Pareto efficient with respect to one set of agents. We show that this property may not be satisfied in a matching when preferences are not separable.
Finally, we introduce a mechanism that for any profile of separable preferences finds a stable matching that satisfies "No Advantageous Reallocation". Additionally we show that the proposed mechanism is strategyproof

- **Zhu M. (GATE)**
Choice with Switching Costs

In real-life matching problem, boundedly rational people may engage in strategic behavior under the Deferred Acceptance mechanism, resulting in unstable outcome and reducing overall welfare. How to reduce strategic behavior is thus of importance for field implementation. I address this issue in a laboratory experiment by looking at whether highly experienced people can transmit what they have learned and encourage new participants to reveal their true preferences (i.e., best strategy), as people in reality usually consult those who have participated in this one-shot game. In this experiment, subjects repeatedly play the matching game induced by the Deferred Acceptance mechanism for a finite number of periods, and then offer advice about

best strategies to their successors. Participants in succeeding sessions are either given advice from their predecessors or observe histories of previous sessions. I find that subjects are also more likely to play truthfully when learning from their peers in previous sessions, either through advice or histories. Moreover, advice works significantly better than histories. This implies that policy makers can encourage real people to adopt truth-telling in the field by simply providing them with collections of good advice from people who have already participated in matching market.

School Assignment

- **Aygün O. (Boğazici University)**
College Admission with Multidimensional Privileges: The Brazilian Affirmative Action Case

In August of 2012 the Brazilian federal government enacted a law mandating the implementation of affirmative action policies in public federal universities for candidates from racial minorities, low income families and those coming from public high-schools. We show that by using the method proposed by the government, the choices made by the colleges will not satisfy a general fairness condition and that moreover students who strategize over the privileges that they claim may improve their placement. Data from university admissions in more than 3,000 programs in 2013 show that the conditions for those undesirable incentives are observed in more than 49% of them. We propose a choice function for the colleges that removes any gain from strategizing over the privileges claimed, is fair, satisfies the substitutes condition and under reasonable assumptions on the type distribution of the population fully satisfies the diversity objectives expressed by the reserves. We finalize by proposing a strategy-proof mechanism that matches students and colleges with the use of the proposed choice function.

- **Hammond R.G. (North Carolina State University)**
Identifying Sincere and Sophisticated Students in School Assignment: Direct Evidence from Application Data

An important, but underexplored, component of student assignment procedures is heterogeneity in the level of strategic sophistication among students seeking school assignment. Our work provides the first direct measure of which students rank schools following their true preference order (sincere students) and which rank schools by manipulating their true preferences in response to their probability of admission to each school (sophisticated students). We present evidence that our measure of sophistication is capturing systematic differences in the ranking behavior of students. Specifically, the students that we identify as sophisticated are more likely to receive a magnet assignment but, conditional on receiving a magnet assignment, are less likely to be assigned to a highly popular school. Further, we find that sophisticated students are substantially more likely to exit the school system (perhaps to attend a charter or private school) but only for sophisticated students whose magnet applications were unsuccessful. We then present a new approach for simulating the true preferences of sophisticated students, accounting for the fact that we use data from a manipulable mechanism.

- **Dur U. (North Carolina State University)**
Flexible Top Trading Cycles and Chains Mechanism: Maintaining Diversity in Erasmus Student Exchange

In Europe, every year more than 200,000 college students study in different countries thanks to the Erasmus Student Exchange program. The program aims to improve the integration all around the Europe. Although this Exchange program is successful in many dimensions, it has two major drawbacks. First of all, the number of exchange students imported and exported by countries is not balanced. Unbalanced exchange causes financial burden for countries that are importing more exchange students then their exports. Secondly, we do not observe diversity among the exchange students. That is, certain countries are exchanging students mainly between each other. To solve these two problems observed in the current practice, we propose a version of

Top Trading Cycles and Chains (TTCC) mechanism. We show that our mechanism solves these observed problems while satisfying constrained efficiency, strategy-proofness and fairness. Moreover, TTCC may increase the number of students benefiting from the Erasmus program. To our knowledge, this is the first application of TTCC mechanism to the many to one market.

Strategy-Proofness 3

- **Masso J. (Universitat Autonoms de Barcelona)**
  On Strategy-proofness and the Salience of Single-peakedness

We consider strategy-proof social choice functions operating on a rich domain of preference pro.les. We show that if the social choice function satis.es in addition tops-onlyness, anonymity and unanimity then the preferences in the domain have to satisfy a variant of single-peakedness (referred to as semilattice single-peakedness).We do so by deriving from the social choice function an endogenous partial order (a semilattice) from which the notion of a semilattice single-peaked preference can be defined. We also provide a converse of this main .nding. Finally, we show how well-known restricted domains under which nontrivial strategy-proof social choice functions are admissible can be seen as particular instances of our setting.

- **You J.S. (California State University, East Bay, Hayward, CA)**
  Efficient and Budget-Balanced Assignment with Single-Peaked Preferences

A fixed amount of divisible resource is distributed among agents whose preferences are single-peaked. Under the condition of no free disposal and no sidepayment, uniform rule is characterized as the only mechanism which achieves stategy-proofness, ordinal efficiency and anonymity. The uniform rule is also the only rule which satisfies stategy-proofness, ordinal efficiency and equal treatment of equals. We show that among anonymous strategy-proof mechanisms, uniform rule maximizes the worst-case cardinal welfare of the agents with single-peaked preferences. This fact does not change even when budget-balancing sidepayment is introduced.