

Lausanne Matching and Market Design Workshop 2024

University of Lausanne, HEC – May, 27th – 28th 2024

All talks will take place in person at the **University of Lausanne, Extranef 125**.

May 27th 2024

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| 11:45 – 13:30 | Welcome at Internef 538 , Bettina’s office (leaving from there to lunch at 12:00 at the “Banane”) |
| 14:00 – 14:45 | Characterizing the Typewise Top-Trading-Cycles Mechanism for Multiple-Type Housing Markets , <i>Flip Klijn</i> (Institute for Economic Analysis (CSIC) and Barcelona School of Economics), joint with Di Feng and Bettina Klaus. |
| 14:45 – 15:30 | Object allocation problems with coalitional endowments: sequential priorities-augmented top trading cycles mechanisms , Bettina Klaus (University of Lausanne), joint with Di Feng. |
| 15:30 – 16:00 | Coffee break |
| 16:00 – 16:45 | School choice with farsighted students , <i>Ana Mauleon</i> (CORE/LIDAM, UCLouvain), joint with Ata Atay and Vincent Vannetelbosch. |
| 16:45 – 17:30 | Matching markets with farsighted couples , <i>Ata Atay</i> (University of Barcelona), joint with Sylvain Funck, Ana Mauleon and Vincent Vannetelbosch. |
| 19:00 | Dinner for speakers at Brasserie Montbenon |

May 28th 2024

- 09:15 – 10:00 **Do School Choice Mechanisms Affect School Segregation?**, *Szilvia Papai* (Concordia University), joint with Muntasir Chaudhury.
- 10:00 – 10:45 **When Geography Shapes Preferences: Redesigning Teacher Assignment in Italy**, *Battal Doğan* (University of Bristol), joint with Mariagrazia Cavallo.
- 10:45– 11:15 Coffee Break
- 11:15 – 12:00 **The Division Problem of Chances**, *Rasoul Ramezani* (University of Lausanne).
- 12:00 – 12:45 **Welfare lower bounds in House Allocation Problems with Existing Tenants: A characterization**, Yang Chen (University of Lausanne), joint with Di Feng.
- 13:30 Lunch at the “Banane”

Abstracts (in sequence of presentations)

Characterizing the Typewise Top-Trading-Cycles Mechanism for Multiple-Type Housing Markets, *Flip Klijn* (Institute for Economic Analysis (CSIC) and Barcelona School of Economics), joint with Di Feng and Bettina Klaus.

We consider the generalization of the classical Shapley and Scarf housing market model (Shapley and Scarf, 1974) to so-called multiple-type housing markets (Moulin, 1995). Throughout the paper, we focus on strict preferences. When preferences are separable, the prominent solution for these markets is the typewise top-trading-cycles (tTTC) mechanism.

We first show that for lexicographic preferences, a mechanism is unanimous (or onto), individually rational, strategy-proof, and non-bossy if and only if it is the tTTC mechanism. Second, we obtain a corresponding characterization for separable preferences. We obtain additional characterizations when replacing [strategy-proofness and non-bossiness] with self-enforcing group (or pairwise) strategy-proofness. Finally, we show that for strict preferences, there is no mechanism satisfying unanimity, individual rationality, and strategy-proofness. We obtain further impossibility results for strict preferences based on weakening unanimity to ontonecess and on extending the tTTC solution.

Our characterizations of the tTTC mechanism constitute the first characterizations of an extension of the prominent top-trading-cycles (TTC) mechanism to multiple-type housing markets.

Object allocation problems with coalitional endowments: sequential priorities-augmented top trading cycles mechanisms, Bettina Klaus (University of Lausanne), joint with Di Feng.

We consider an extension of Shapley-Scarf housing markets (Shapley and Scarf, 1974) and house allocation problems (Hylland and Zeckhauser, 1979) to object allocation problems with coalitional endowments (housing markets with existing tenants are an example). For this relatively new class of problems, we consider natural extensions of properties that have been considered for these classical benchmark models as well as a new property: coalitional endowment lower bound (extending individual rationality), group strategy-proofness (applicable without change), coalitional endowments neutrality (extending neutrality), and the new property of preferences swapping reallocation proofness. Our main result is the characterization of a new class of mechanisms by the above properties, the class of sequential priorities-augmented top trading cycles mechanisms.

School choice with farsighted students, Ana Mauleon (CORE/LIDAM, UCLouvain), joint with Ata Atay and Vincent Vannetelbosch.

We consider priority-based school choice problems with farsighted students. We show that a singleton set consisting of the matching obtained from the Top Trading Cycles (TTC) mechanism is a farsighted stable set. However, the matching obtained from the Deferred Acceptance (DA) mechanism may not belong to any farsighted stable set. Hence, the TTC mechanism provides an assignment that is not only Pareto efficient but also farsightedly stable. Moreover, looking forward three steps ahead is already sufficient for stabilizing the matching obtained from the TTC.

Matching markets with farsighted couples, Ata Atay (University of Barcelona), joint with Sylvain Funck, Ana Mauleon and Vincent Vannetelbosch.

We adopt the notion of the farsighted stable set to determine which matchings are stable when agents are farsighted in matching markets with couples. We show that a singleton matching is a farsighted stable set if and only if the matching is stable. Thus, matchings that are stable with myopic agents remain stable when agents become farsighted. Examples of farsighted stable sets containing multiple non-stable matchings are provided for markets with and without stable matchings. For couples markets where the farsighted stable set does not exist, we propose the DEM farsighted stable set to predict the matchings that are stable when agents are farsighted.

Do School Choice Mechanisms Affect School Segregation?, Szilvia Papp (Concordia University), joint with Muntasir Chaudhury.

We use a stylized model to explore whether the choice of the matching mechanism in school choice has an impact on school segregation. We find that the Deferred Acceptance mechanism, together with all stable and stable-dominating mechanisms, as well as the Top Trading Cycle mechanism, lead to complete segregation, while the Immediate Acceptance mechanism and Chinese Parallel mechanisms, among others, result in less segregation. We also check the impact of homogeneous priorities and homogeneous preference.

When Geography Shapes Preferences: Redesigning Teacher Assignment in Italy, Battal Doğan (University of Bristol), joint with Mariagrazia Cavallo.

We investigate Italy's centralized teacher assignment system where teachers can rank "geographical regions", leading to ties in their rank order lists (ROLs). We show that the way ties in teachers' ROLs are resolved in the current assignment mechanism systematically violates teachers' priority rights and results in justified envy. We propose a new mechanism that is strategy-proof, eliminates justified envy, and Pareto improves over the benchmark deferred acceptance mechanism with simple tie-breaking (DA-STB). Using administrative data, we provide evidence that our proposed mechanism can potentially bring about significant welfare improvements over the benchmark DA-STB.

The Division Problem of Chances, Rasoul Ramezani (University of Lausanne).

In frequently repeated matching scenarios, individuals may require diversification in their choices. Therefore, when faced with a set of potential outcomes, each individual may have an ideal lottery over outcomes that represents their preferred option. This suggests that, as people seek variety, their favorite choice is not a particular outcome, but rather a lottery over them as their peak for their preferences. We explore matching problems in situations where agents' preferences are represented by ideal lotteries. We discuss properties such as strategy proofness, replacement monotonicity, (Pareto) efficiency, in-betweenness, non-bossiness, envy-freeness, and anonymity in the context of dividing chances, and propose a class of mechanisms called URC mechanisms that satisfy these properties. Subsequently, we prove that if a mechanism for dividing chances is strategy proof, (Pareto) efficient, replacement monotonic, in-between, non-bossy, and anonymous (or envy free), then it is equivalent in terms of welfare to a URC mechanism.

Welfare lower bounds in House Allocation Problems with Existing Tenants: A characterization, Yang Chen (University of Lausanne), joint with Di Feng.

We study Abdulkadiroglu and Sonmez's house allocation problems with existing tenants (Abdulkadiroglu and Sonmez, 1999). In particular, we focus on three welfare lower bounds conditions for agents, with respect to tenants' endowments, solidarity for newcomers, and fairness for all agents. Based on these three welfare lower bounds conditions, together with other well studied properties, namely pair efficiency, group strategy-proofness and weak neutrality, we characterize a mechanism proposed by Sonmez and Unver (2005): the You Request My House-I Get Your Turn mechanism with Newcomer Priorities (YTP), which is a hybridization of the top trading cycles mechanism and a simple dictatorship of agents without any initial object.

Our result, concerning the house allocation problems with existing tenants and a fixed problem size (i.e., a fixed number of agents and objects), constitutes the first characterization, in the absence of consistency.