Matching Strategies of Heterogeneous Agents in a University Clearinghouse - Extended Abstract

Britta Hoyer, Nadja Maraun

Universität Paderborn

April 14, 2015

In this work we consider the matching process used in a clearinghouse 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. Additionally, we test different matching algorithms using the stated and the true preferences of students, which we have collected by means of a survey, and analyze the outcomes with regard to their efficiency and stability properties.

At the faculty of Business Administration and Economics at the University of Paderborn (from here on UPB), a clearinghouse for the allocation of Bachelor and Master theses to professors was installed in 2011. The clearinghouse is using a slightly modified version of what is known as the Boston Mechanism (for the original mechanism see Abdulkadiroğlu et al. (2005)) for this allocation process. The clearinghouse was installed to ensure that, with an increasing student population, all students would have the possibility to write their thesis and the amount of theses to be supervised is distributed in a fair way among all the professors.

Students who want to write their thesis at one of the chairs participating in the central clearinghouse, need to enroll in the central clearinghouse during 2 weeks before the end of a given semester via a University website.\(^1\) When enrolling in the clearinghouse, students have to give an ordered ranking of their top three preferred chairs for writing their thesis, as well as if they had to write a Bachelor thesis, a Master thesis, or a seminar paper. Furthermore, there is a general requirement for students to upload their CV and a current statement of their grades. After all the students enrolled in the clearinghouse, to ensure a fair distribution of the theses, a total sum of points is calculated, where Bachelor theses and seminar papers count for one point and Master theses for one and a half point. This total number of points is divided by the total number of full time equivalent positions (FTEs) in the department. Afterwards, every chair

\(^1\)To be eligible to write a thesis in a given term, a student needs to have at least 100 (out of 180) creditpoints for a Bachelor thesis and 60 (out of 120) creditpoints for a Master thesis.
gets a number of points he needs to fulfill given the number of FTEs at the chair. Once the registering period is over, chairs get to decide which students to accept, where they can accept students who stated the chair as a first preference in the first round. In the second round, they can accept students who stated the chair as second preference, if the student has not been accepted by his first preference yet. After 3 rounds, there is a final round in which any remaining students will be allocated.

In our paper we aim to evaluate this system. First results of the analysis of the data show that in the current matching system a large majority of students gets a place with their first stated priority. This is in line with other results that have been obtained using the Boston Mechanism, however, e.g. Pais and Pintér (2008) show that most of these preferences do not correspond to the true preferences of students. This is due to the lack of strategy proofness of the Boston mechanism. Chen and Sönmez (2006) show that around 80% of students manipulated their preferences under the Boston mechanism. We therefore conducted a survey among the participants in the clearinghouse in the previous semester to obtain students true preferences.2 In the survey students are asked about their true preferences, their stated preferences, their reasons for choices as well as their general satisfaction with and degree of understanding of the clearinghouse. By means of this survey we obtained a full list of preferences of the students. In a first step of our analysis we have already found that there is a significant difference between students’ stated and true preferences. While only around 25% of students do not give their true first preference, over 50% (60%) do not state their true second (third) preference in the mechanism. In a next step we will use the survey data to extract strategies students used in the mechanism. A number of such strategies has already been identified in different school choice problems. Examples of this are the small school bias, the priority school bias or the Minnesota strategy (see e.g. Pais and Pintér (2008) or Chen and Sönmez (2006)). Once these strategies have been identified, we will use the joined data base we construct from the survey and the actual data from the clearinghouse, as a testbed to evaluate different matching mechanisms. We will evaluate the mechanisms taking into account the strategies used by the students and analyze how this will impact the stability and efficiency of the mechanisms. Additionally we will take into account information on outside options that we get from the survey to analyze how this impacts students behavior (see e.g. Kesten and Kurino (2013)) and how the number of stated preferences will influence the choice of students (see e.g. Calsamiglia et al. (2010)).

We will thus be able to compare the results found in theoretical, empirical and experimental work on school choice to the results in an actual clearinghouse with students’ real and stated preferences, where we benefit from having data on the true and stated preferences of students. Additionally we aim to add to the literature by introducing heterogeneous constrained rational actors. So far this line of research has not received to much attention, with the notable

\[2\] We will conduct further rounds of this survey with participants of this semester’s clearinghouse.
exception of Pathak and Sönmez (2008). In a theoretical paper, they analyze in how far the strategy proof student optimal mechanism and the not strategy proof Boston mechanism favor strategic or sincere families.

JEL Classification: D47, C78

Bibliography

References


