

MULTI-OBJECT AUCTION DESIGN: EX-POST REVENUE MAXIMIZATION WITH NO WASTAGE*

Tomoya Kazumura, Debasis Mishra, and Shigehiro Serizawa †

April 17, 2017

Abstract

A seller is selling multiple objects to a set of agents. Each agent can buy at most one object and his utility over consumption bundles (i.e., (object, transfer) pairs) need not be quasilinear. The seller considers the following desiderata for her mechanism, which she terms *desirable*: (1) *dominant strategy incentive compatibility*, (2) *ex-post individual rationality*, (3) *equal treatment of equals*, (4) *no wastage* (every object is allocated to some agent). The minimum Walrasian equilibrium price (MWEP) mechanism is desirable. We show that the MWEP mechanism is *ex-post revenue optimal* among all desirable mechanisms satisfying *no subsidy*, i.e., for each preference profile, the MWEP mechanism generates more revenue for the seller than any desirable mechanism satisfying no subsidy. Our result works both for quasilinear type space, where the MWEP mechanism is the VCG mechanism, and for various non-quasilinear type spaces, some of which incorporate positive income effect of agents. We can relax no subsidy to *no bankruptcy* in our result for certain type spaces with positive income effect.

KEYWORDS. Ex-post revenue optimality, no wastage, equal treatment of equals, strategy-proofness, minimum Walrasian equilibrium price mechanism, non-quasilinear preferences.

JEL CLASSIFICATION NUMBERS. D44, D47, D63, D82.

*We are grateful to Brian Baisa, Yeon-koo Che, Bhaskar Dutta, Albin Erlanson, Johannes Horner, Komal Malik, James Schummer, Ryan Tierney for useful comments and discussions. The authors thank participants at the Advances in Mechanism Design conference at NYU Abu Dhabi, and seminar participants at Hitotsubashi University, Indian Statistical Institute, MEDS Lunch Seminar at Kellogg for their comments.

†Kazumura: Graduate School of Economics, University of Tokyo, pge003kt@student.econ.osaka-u.ac.jp; Mishra: Indian Statistical Institute, Delhi, dmishra@isid.ac.in; Serizawa: Institute of Social and Economic Research, Osaka University, serizawa@iser.osaka-u.ac.jp