

# Circulation under Responsive Preferences

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## Abstract

We study markets in which each agent is endowed with multiple units of an indivisible and agent-specific good. Monetary compensations are not possible. An outcome of a market is given by a circulation which consists of a balanced exchange of goods. Agents only have (responsive) preferences over the bundles they receive.

We prove that for general capacity configurations there is no circulation rule that satisfies individual rationality, Pareto-efficiency, and strategy-proofness. We characterize the capacity configurations for which the three properties are compatible, and show that in this case the Circulation Top Trading Cycle (cTTC) rule is the unique rule that satisfies all three properties. We explore the incentive and efficiency properties of the cTTC rule for general capacity configurations and provide a characterization of the rule for lexicographic preferences.

Next, we introduce and study two families of individually rational serial rules in which agents sequentially choose single goods or bundles. We show that in the first (second) case the rules are Pareto-efficient for lexicographic (responsive) preferences. Finally, we consider the family of Segmented Trading Cycle (STC) rules where agents are required to exchange their goods in market segments. We show that STC rules are strategy-proof.