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Gabriel Carroll

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# A General Equivalence Theorem for Allocation of Indivisible Objects

Gabriel Carroll, Stanford University

`gdc@stanford.edu`

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## Abstract

We consider situations in which  $n$  indivisible objects are to be allocated to  $n$  agents. A number of recent papers studying such allocation problems have shown various interesting equivalences between randomized mechanisms based on trading and randomized mechanisms based on serial dictatorship. We prove a very general equivalence theorem from which many previous equivalence results immediately follow, and we give several new applications. Our general result sheds some light on why these equivalences hold by presenting the existing serial-dictatorship-based mechanisms as randomizations of a general mechanism which we call *serial dictatorship in groups*. Our proof technique also streamlines the bijective methods used in previous proofs, showing that it is enough to assemble a bijection from smaller pieces, without needing to construct the pieces explicitly.

Keywords: Equivalence; indivisible goods; random assignment; random serial dictatorship; serial dictatorship in groups; top trading cycles

JEL Classifications: C78, D79

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