

# Sharing Variable Returns of Cooperation

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## Abstract

A finite set of agents jointly undertake a project. Depending on the aggregate of individual agent characteristics the project runs losses or profits, which have to be shared. This paper adopts the mechanistic view and concentrates on devices that a contingent planner may use in order to share the net profits. The Moulin and Shenker (1994) representation theorem is used to show that *additive* mechanisms with the *constant returns* property relate 1 to 1 to *rationing methods*. Refinements are discussed dealing with monotonicity and equity properties that relate to the dispersion of shares. The second part introduces the notion of a *consistent solution*. Each rationing method induced by a consistent mechanism is consistent. If such mechanism is continuous as well, then the corresponding rationing method is *parametric*. Most prevalent mechanisms (average, serial, Shapley-Shubik) are consistent as member of the class of *incremental mechanisms*. Each *interval consistent* incremental mechanism is shown to be a composition of *marginal mechanisms* and the average mechanism. Immediately the average mechanism is the unique *strongly consistent* solution. Finally a characterization of mechanisms within the general class is discussed using *super-additivity*.

**Keywords:** cooperative production, cost sharing, mechanism design, investment, (parametric) rationing, core, additivity, monotonicity

**JEL-Classification:** C70, D63, D70

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