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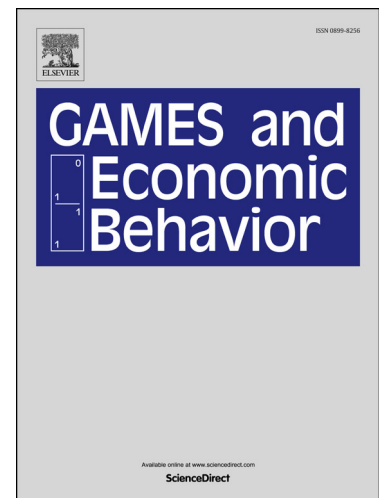
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Balanced externalities and the Shapley value

Ben McQuillin^a, Robert Sugden^b

*School of Economics and Centre for Behavioural and Experimental Social Science,
University of East Anglia, Norwich NR4 7TJ, UK.*

^a*b.mcquillin@uea.ac.uk*

^b*r.sugden@uea.ac.uk*

Abstract

We characterize the Shapley value using (together with standard conditions of efficiency and equal gains in two-player games) a condition of ‘undominated merge-externalities’. Similar to the well-known ‘balanced contributions’ characterization, our characterization corresponds intuitively to ‘threat points’ present in bargaining. It derives from the observation that all semivalues satisfy ‘balanced merge-externalities’. Our characterization is applicable to useful, narrow sub-classes of games (including monotonic simple games), and also extends naturally to encompass games in partition function form.

Keywords:

Shapley value, balanced contributions, merge-externalities, semivalues, coalitional bargaining

JEL classification: C71, C78

1. Introduction

In this paper, we provide a new characterization of the Shapley value (Shapley, 1953). The distinctive axiom of this characterization can be interpreted as a condition of balance between the threats that players can make to one another in an unmodelled bargaining process.

A motivation for our characterization lies in our interpretation of Shapley’s own understanding of his contribution. Shapley (1953) presents the value as a proposal about how players will ‘evaluate ... the prospect of having to play a game’, and treats this as an answer to a foundational problem in the theory of games. The implication is that Shapley’s project is to find general principles that characterize the expected utility outcomes of rational play in abstract games. Shapley and Shubik (1969) later describe the value as addressing ‘the idea of “fair division” in a socio-economic situation’, but

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