

Equity and Efficiency in a Measure Space with Nonadditive Preferences: The Problem of Cake Division α

Nobusumi Sagaray

Faculty of Economics, Hosei University

4342, Aihara, Machida, Tokyo

194-0298 Japan

e-mail: nsagara@mt.tama.hosei.ac.jp

Milan Vlachz

School of Mathematics and Physics, Charles University

Malostranske namesti 25

118 00 Praha 1, Czech Republic

e-mail: mvlach@ksi.ms.mff.cuni.cz

May 16, 2005

Abstract

This paper considers a classical problem of cake division in a nonatomic finite measure space among finitely many individuals. We investigate a nonadditive continuous preference relation in a Borel $\frac{3}{4}$ -field and prove the existence of Pareto optimal envy-free partitions, Pareto optimal \mathbb{R} -equitable partitions, and \mathbb{R} -Rawls optimal partitions. We also show that Pareto optimal \mathbb{R} -equitability is equivalent to \mathbb{R} -Rawls optimality, but Pareto optimality does not imply Rawls optimality.

Mathematics Subject Classification 2000: Primary 28A10, 91B16;

Secondary

90C29, 91B32.

Journal of Economic Literature Classification: C61, D63.

Key words: Nonadditive continuous preferences; Pareto optimality;

Envy-freeness; \mathbb{R} -equitability; \mathbb{R} -Rawls optimality.