Linearly continuous preferences and equilibrium analysis in a finite dimensional commodity space

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Abstract

Herstein and Milnor [Herstein, I.N. and J. Milnor, 1953. An axiomatic approach to measurable utility, Econometrica 21, 291-297] assumed that preferences are continuous with respect to every straight line. We refer to this notion of continuity as linear continuity. Young and Young [Young, W.H. and G.C. Young, 1910. Discontinuous functions continuous with respect to every straight line, Quarterly Journal of Pure and Applied Mathematics 41, 87-93] showed that linear continuity is strictly weaker than usual continuity. We show that when the commodity space is finite dimensional, the linear continuity of preferences is sufficient for the representation by a real-valued function and the existence of Walrasian equilibrium.

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