The Relationship between Revealed Preference and the Slutsky Matrix

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Abstract

This study provides a calculation method for utility function from a smooth demand function whose Slutsky matrix is negative semi-definite and symmetric. Moreover, this study presents an axiom of demand functions, and show that under the strong axiom, this axiom is equivalent to the existence of the corresponding continuous preference relation. If the demand function obeys this axiom, then such a preference relation is unique, and our calculating utility function represents its preference relation. These results are obtained even if the demand function is not income-Lipschitzian. Further, this study shows that the mapping from demand function into continuous preference relation is continuous, which assures the applicability of our results for econometrics. Moreover, this study shows that if this demand function satisfies the rank condition, then our utility function is smooth. Lastly, this study shows that under an additional axiom, the above results hold even if the demand function has a corner solution.

Keywords: demand function, utility function, Slutsky matrix, integrability theory, revealed preference.

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