Nonparametric Welfare Analysis for Discrete Choice with Multiple Compensation Timings*

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Abstract

We consider welfare analysis in a discrete choice framework where income receipts and price payments occur over multiple periods, allowing for unrestricted unobserved heterogeneity in individual preferences. For changes in prices at multiple periods, we extend the definitions of welfare measures, such as compensating variation and equivalent variation, to incorporate income adjustments over time. This framework naturally generalizes Bhattacharya (2015, 2018) by accommodating multiple periods with fully unrestricted heterogeneity in factors such as borrowing constraints, interest rates, and saving behaviors, all of which are assumed to be unobservable to the econometrician. We then clarify the situations in which the distribution functions of the welfare measures can or cannot be nonparametrically point-identified. Especially, we show that when price changes have the same sign across periods, the distribution functions of the following welfare measures are nonparametrically point-identifiable from choice probabilities; these welfare measures compensate individuals in each period in proportion to that period's price change relative to the total price change over all periods.

Keywords: Discrete Choice, Unobserved Heterogeneity, Multiple Periods, Welfare Analysis, Nonparametric Identification

JEL Classification: C14, C25, D12, D61

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