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Thesis Abstract

Nonparametric Analysis of Random Preference Models That Allows for Nontransitivity (Job Market Paper)

The Random Utility Model (RUM) is widely recognized as the gold standard for analyzing consumer behavior within a population. However, the foundational assumption of transitivity in consumers' preferences — a key element of the RUM — is often violated in empirical studies. To address this limitation, I propose the Random Preference Model (RPM), an alternative framework that accommodates nontransitive preferences. Moreover, choices generated by the RPM are consistent with the Weak Axiom of Revealed Preference (WARP), which states that a consumer who prefers one option over another when both are available should not reverse this preference in a different context. This contrasts with the Strong Axiom of Revealed Preference associated with the RUM, which assumes both transitivity and adherence to WARP. My approach leverages the empirical relationship between WARP and the preference function model and allows for the development of a consumer theory that is specifically designed to be consistent with WARP. This framework provides a practical method for modeling nontransitive consumer behavior. To evaluate the RPM's validity, I conduct a nonparametric test in which the null hypothesis is that a population of rational consumers generated a sample of cross-sectional demand distributions. This test examines a necessary and sufficient condition, allowing for unrestricted unobserved heterogeneity and any number of goods. Applying the test to the U.K. Family Expenditure Survey data, I find that the RPM outperforms the RUM in explaining consumer behavior. This result highlights the need for more flexible models to better describe consumer decision-making.

A Rationalization of the Pairwise Homothetic Axiom of Revealed Preference, with Victor Aguiar and Per Hjerstrand

Homotheticity is a property of preferences where proportional scaling of all consumption bundles preserves the same preference ranking. This feature simplifies economic analysis by allowing a single indifference curve to summarize a consumer's entire preference profile. This paper addresses the empirical implications of consumer behavior with nontransitive and homothetic preference relations. The datasets consist of finitely many observations of price vectors and consumption bundles. We rationalize Varian (1982)'s pairwise homothetic axiom of revealed preference (PHARP) in a consumer setting that does not require transitivity. The central insight is an exact analog of Varian (1982)'s theorem on nonparametric tests for homothetic utility maximization applied specifically to PHARP. Finally, we outline a method for recovering valid homothetic preferences when the data adhere to PHARP. We show that applying Knoblauch (1993)'s approach to data satisfying PHARP but not HARP can lead to non-sharp lower and upper bounds.

Nonparametric Analysis of Income Compensation Functions Robust to Nontransitive Preferences, with Charles-Olivier Takongmo and Roland Pongou

Preference recoverability and welfare analysis, as proposed by Varian (1982), may provide limited insights when the Weak Generalized Axiom of Revealed Preference (WGARP) holds and consumers do not act as utility maximizers. In this paper, we extend this observation to the analysis of income compensation functions. We develop a method to recover the true income compensation function when consumers are not utility maximizers. Our method uses a finite set of price and quantity data that satisfy WGARP, in contrast to the reliance on the generalized axiom of revealed preference in Varian (1982). Our methodology leverages the empirical relationship between WGARP and the coalitional multi-utility (CMU) model to determine these bounds. The CMU model facilitates the development of a consumer theory tailored to WGARP and provides a practical framework for modeling nontransitive consumer behavior. We show that our welfare bounds are tighter than the nonparametric bounds for the income compensation function proposed by Varian (1982). This research contributes to the refinement of welfare economics by providing a robust and nonparametric approach to deriving income compensation functions and cost-of-living indices.