

Research Statement

My research integrates economic theory and econometrics to enhance the estimation of key structural parameters and improve the robustness of counterfactuals such as to better inform the design of policies, particularly those affecting children.

Identification and Estimation of Production Functions Production functions are central to various fields of demand analysis, including price search, general equilibrium, and human capital. [3] demonstrates that consumer preferences are both necessary and sufficient for the nonparametric identification of production functions across a range of consumer models, utilizing cross-equation restrictions implied by first-order conditions. This allows empirical researchers to choose optimal assumptions for identification based on their specific applications. In a model of price search where consumers can reduce their own prices paid through search, implicit search costs (e.g., opportunity cost of time) are estimated from minimal assumptions on the price function informed by data on prices paid and search intensity. In a household production context, [2] considers a collective model that incorporates children where the impacts of parental inputs on children welfare is captured by a household production function. The study addresses the identification problem posed by the unobservable nature of children welfare and proposes a partial identification strategy to show how parenting skills vary with household characteristics. By treating children welfare as unobservable and accommodating heterogeneity in the production technology, the framework facilitates the evaluation of policies targeted at families.

Nonparametric Consumer Analysis [1] provides a nonparametric revealed preference characterization of the exponential discounting model that enables an investigation of its sources of departure. The representation allows to differentiate between deviations from static utility maximization and time consistency, permitting to measure the severity of each deviation. [5] provides a dynamic random utility model that accommodates unrestricted time correlation and cross-sectional heterogeneity in preferences. The framework unifies the deterministic revealed preference paradigm with the nonparametric random utility approach. By leveraging information encoded in longitudinal choice data, [5] provides a more informative test of stochastic utility maximization while relaxing preference stability inherent to revealed preference analysis. [4] provides a novel method to test whether decision makers belong to specific classes of preferences through preference learnability results. The approach gives a natural way to analyze the statistical power of revealed preference tests.

Future work I am currently developing computational tools that draw from recent advances in machine learning such as the Adversarial Method of Moments to speed up the implementation of estimation methods for partially identified models. This project complements my existing research as nonparametric methods often require significant computational resources that can be scaled down through innovative techniques. In joint work, a collective model of exponential discounting within a random utility framework is considered to better understand the causes of time-inconsistent behavior by explicitly

accounting for individual heterogeneity and changes in preferences. In another joint work, a new method is developed to deliver approximations for average and distributional welfare estimates robust to unobserved preference heterogeneity. These projects align with a common theme in my research that emphasizes the importance of heterogeneity to better inform policy-making.

Bibliography

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- [4] Charles Gauthier, Raghav Malhotra, and Agustín Troccoli Moretti. Finite tests from functional characterizations. 2024.
- [5] Nail Kashaev, Victor Aguiar, Martin Plávala, and Charles Gauthier. Dynamic and stochastic rational behavior. 2023.