

Abstract

Applied microeconometrics is an essential topic in the study of econometrics. In recent years, there is a rapid development in microeconometrics concepts for two main reasons: (i) The introduction of causal inference frameworks that help the interpretation of policy or treatment effects, and (ii) technology innovations that make it possible to analyze big data.

This thesis contains theoretical and application parts that help extend the existing literature. In the theoretical part, I propose a Difference-in-Differences (DiD) estimand that can assess the heterogeneity in treatment effects as in Chapter 2. This work widens the existing DiD approaches by providing an integration of DiD method that can evaluate the heterogeneity in treatment effects with respect to covariate values, treatment timing, and periods. I propose results of identification, estimation, and uniform inference for the proposed estimand, and prove the validity of uniform confidence bands for both analytical and bootstrap approaches. The corresponding R package is also provided for easy implementation of this estimand.

In the application part, I provide two application examples of microeconomic methods in specific fields of economics. In Chapter 3, I develop a novel partial equilibrium model that explains how the population distribution of aggregate areas is affected by the compactness of the Mass Transit System (MTS). The framework of modelling follows from the bid rent approach and fundamental urban economics discussions. The result of this model implies that the more compact (less compact) MTS structure leads to a higher (lower) population density in urban areas. The data from Wuhan, China is used to justify this assertion, while I propose an instrumental variable to deal with endogeneity, which relates to the hydrology characteristic of Wuhan. The estimation results align with the theoretical assertion.

In Chapter 4, I develop an equilibrium model of undergraduate higher education that incorporates inter-regional mobility for enrollment, to assess the effects of uneven distribution of higher education facilities with respect to regions on potential higher education receivers in Japan. Parameters of the model are estimated using the data of inter-regional movement for attending undergraduate higher education in Japan. This model sheds light on the welfare cost of uneven location distribution of college quality among regions.