Three Essays on Microeconometric Analysis

Yanchun Jin

Digest

Owing to a great availability of data from cross-section and longitudinal census data nowadays, microeconometric analysis, the analysis of individual-level data on the economic behavior, is becoming useful to investigate the economic problem. This thesis discusses three topics on microeconometric analysis.

Chapter 2 proposes nonparametric tests for the null hypothesis that a treatment has a zero effect on the conditional variance for all subpopulations characterized by the values of the covariates. Recently, treatment effect analyses have become important tools in various fields of empirical research to evaluate the impacts of policies. In this chapter, we consider the effect of a treatment on the variance. Most existing studies focus on various treatment effects on the mean of the outcome of interest, such as the average treatment effect and the local average treatment effect. These parameters measure the extent to which the treatment changes the level of the outcome. However, researchers are also interested in the treatment effect on the dispersion of the outcome.

In this chapter, we provide nonparametric tests for the effect of a treatment on the variance. In particular, we consider a test for the null hypothesis that the treatment has a zero effect on the dispersion of the outcome for all subpopulations defined by covariates. The null hypothesis considered here is that the difference between the conditional variances of the outcomes of the treatment group and control group is zero for all subpopulations defined by the covariates. We estimate the conditional variances using the series method. We provide a test rule that compares a Wald-type test statistic with the critical value of a chi-squared distribution. We also construct a normalized test statistic that is asymptotically standard normal under the null hypothesis. We illustrate the usefulness of the proposed test by Monte Carlo simulations and an empirical example that investigates the effect of unionism on wage dispersion. we conduct two specifications of the test with covariates selected by the "top-down" and "bottom-up" methods. We find that conditioned on some subpopulation, unionism might affect the inequality of workers' wages, but in other years (1981 and 1984), there is no statistical evidence that unionism has changed the inequality of their wage for any subpopulation. However, in some years, unionism tends to lead to differences of inequality in some groups of workers.

Chapter 3 (joint with Ryo Okui) proposes an econometric procedure to test for the presence of overconfidence using data collected by "ranking experiments".

A large body of the studies show that people tend to overestimate their capabilities and overconfidence is recognized as a common phenomenon. However, a recent study by Benoît and Dubra (2011) points out that we should be cautious when interpreting these empirical results. In a ranking experiment, participants are asked to place themselves into one of k equally sized intervals according to their beliefs on their skills relative to other member of groups under question. Benoît and Dubra (2011) show that purely rational Bayesian update can yield only a set of inequalities, not equalities, when it applies to data generated by a ranking experiment.

We construct null hypothesis with a set of moment inequalities according to the theory of Benoît and Dubra (2011) and apply recently developed methods in the moment inequality literature to conduct the test. Our approach is based on the techniques from the moment inequality literature. We propose to apply the tests of moment inequalities developed by Romano et al. (2014) to test such a set of inequalities. We then examine the data from Svenson (1981) on safe drive. Our reexamination of Svenson (1981) data reveals that while we can confirm the presence of overconfidence among American subjects on driving safety, we cannot reject the null of no-overconfidence in the other three cases.

Chapter 4 (joint with Ryo Okui) proposes a method to construct uniform confidence bands for marginal treatment effect function. Marginal treatment effect interprets the gain for individuals at the margin of indifference between participating in a treatment or not, and it is widely used in empirical analyses. We construct a uniform confidence band based on a local linear estimator of marginal treatment effect. Our method is based on an approximation of the supremum of Gaussian process and Gaussian approximation. It does not require computer intensive method and is easy to implement.

Mathematical proofs regarding Chapters 2 and 4 are provided in Appendix A and Appendix B, respectively.

References

Benoît, J.-P. and J. Dubra (2011). Apparent overconfidence. *Econometrica 79*(5), 1591–1625.

Romano, J. P., A. M. Shaikh, and M. Wolf (2014). A practical two-step method for testing moment inequalities. *Econometrica 82*(5), 1979–2002.

Svenson, O. (1981). Are we all less risky and more skillful than our fellow drivers? *Acta psychologica 47*(2), 143–148.