Mathematics, Statistics, and Computer Science   **@ UIC**

Statistics and Data Science Seminar

Functional Coefficient Time Series Models with Trending Regressors

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Abstract: We study a functional coefficient time series model with trending regressors, where the coefficients are unknown functions of time and random variables. We propose a local linear estimation method to estimate the unknown coefficient functions. An asymptotic distribution of the proposed local linear estimator is established under mild conditions. A test procedure is developed to test the null hypothesis that the functional coefficients take particular parametric forms. For practical use, we further propose a Bayesian approach to select bandwidths involved in this local linear estimator. Several numerical examples are provided to examine the finite sample performance of the proposed local linear estimator and the test procedure. The results show that the local linear estimator works well and the proposed test has satisfactory size and power. In addition, simulation studies show that the Bayesian bandwidth selection method is better than cross–validation method. Furthermore, we employ the functional coefficient model to study the relationship between consumption per capita and income per capita in U.S. and the results show that functional coefficient model with our proposed local linear estimator and Bayesian bandwidth selection method performs best in both in–sample fitting and out–of–sample forecasting.

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