

Research Statement

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Bubble testing plays a crucial role in financial econometrics. A bubble in asset prices can be characterized by an explosive surge in price series that significantly surpasses the fundamental values. The finance profession has debated the possibility of bubbles from two main perspectives. Efficient market theory argues that when price levels deviate from the true economic values, no arbitrage condition will eventually force the prices back to the rational levels. On the other hand, behavior theory suggests that investors make their decisions with irrational impulses leading to deviations in prices. For instance, investors may base their decisions on past prices, assuming a continuous upward trend. Furthermore, the tendency to buy more intensifies when more people join the market. By empirically testing the evidence, we can gain a deeper understanding of whether there is evidence of bubble behavior and what characteristics it exhibits.

My research focuses on test for fixed unit root against Markov switching unit root models. The testing problem is challenging due to nonstationarity and the presence of nuisance parameters not identified under the null. We generalize the stationarity assumption in Carrasco, Hu and Ploberger (2014). My model is different from the existing literature on stochastic unit roots, where the dynamic structure of the random coefficients is assumed to be fully specified. We fully exploit the Markov property of the random coefficients and show that they are equivalent to the likelihood ratio test. Hence, our tests are asymptotically optimal. Moreover, these tests are easy to implement as they do not require the estimation of the model under the alternative. And I derive an explicit form of limiting distribution of the loglikelihood ratio.

In addition to the i.i.d shocks and markov dynamics, I have a few work-in-progress projects that explore different fields of econometrics. In "Cryptocurrency Price Discrepancies and Financial Integration", a joint work with Meichen, Chen. We find that price discrepancies are larger in countries with confirmed cases of COVID-19 and rigorously implementing lockdown policies. we adopt a difference-in-difference framework to examine how financial integration affects Bitcoin price discrepancies. In "Event Studies of Private Placement and Lifting of Restricted Shares", joint work with Yin Cao, We carried out event studies of private placement announcement effect and stock release in Chinese stock market. Through empirical investigation on 1500 stocks with private placement in recent 3 years.

My long-term research plan is to explore two areas in Econometrics. First, I would like to continue my research on optimal test with my advisor Werner Ploberger. We would like to extend our model to more general cases involving more AR periods and conduct an empirical analysis of bitcoin prices.

The second topic I would like to explore is Bayesian estimation of the nuisance parameter of Markov dynamics in our stochastic unit root model.