



*Department of Mathematics and Statistics  
Colloquium Lecture Series*

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## **INFERENCE FOR TIME SERIES REGRESSION MODELS WITH NONSTATIONARY ERRORS**

In time series regression problems, it is often assumed that the errors in regression models are stationary with weak dependence, and the existing inferential procedures critically depend on this assumption. Recently, there has been a surge of awareness that the stationary error assumption is too restrictive and for many time series of macroeconomic and climate variables, the errors exhibit strong nonstationarity. Thus there is a need to develop new inference methods that account for nonstationary errors. In this talk, we consider two problems in time series regression: inference of the parameter vector in deterministic trend models, and unit root testing in stochastic trend models. In both models, we allow for general forms of nonstationary errors, which can accommodate both smooth and abrupt changes in second order properties. For commonly used statistics based on ordinary least square estimators, we derive the limiting null distributions, which depend on the unknown nonstationarity of the errors in a nontrivial way. To perform the inference, we propose to use the wild bootstrap and one of its variants to approximate the nonpivotal limiting null distributions and rigorously justify the consistency. Numerical results will be presented to demonstrate the size or coverage accuracy achieved by our procedure in comparison with the existing counterparts in presence of nonstationary errors.

Yeonwoo Rho is candidate for statistics position in DMS.

*Thursday, February 20, 2014*

*Chapman 106*

*1:05 – 1:55 pm*

*Refreshments after the talk in Chapman 101A*

