



ÇANKAYA UNIVERSITY  
FACULTY OF ARTS AND SCIENCES  
DEPARTMENT OF MATHEMATICS

## SEMINAR

### State dependent and Time varying Nonlinearity in Unit root testing (non- convergent stochastic difference equation) : Some remarks on decomposition problems

**SPEAKER** : Prof. Dr. Tolga Omay,  
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**DATE** : 18th October, 2019

**TIME** : 13:30

**PLACE** : Çankaya University (Central Campus), R-213

This study explores the methods to de-trend the smooth structural break processes while conducting the unit root tests. Two most commonly applied approaches for modeling smooth structural breaks namely the smooth transition and the Fourier functions are considered. We perform a sequence of power comparisons among alternative unit root tests that accommodate smooth or sharp structural breaks. The power experiments demonstrate that the unit root tests utilizing Fourier function lead to unexpected results. Further, through simulation studies, we investigate the source of such unexpected outcomes. Moreover, we provide the asymptotic distribution of two recently proposed unit root test, namely Fourier-ADF and Fourier-KSS, which are not given in the original studies. Lastly, we find that the selection of de-trending function is pivotal for unit root testing with structural breaks.

*All interested are cordially invited.*

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