Tests for a unit root using three-regime TAR models: Power comparison and some applications

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Abstract

Tests for a unit root using three-regime threshold autoregressive (TAR) models play a significant role in the empirical analysis of some economic theories. This paper compares the powers of recently proposed unit root tests in three-regime TAR models using Monte Carlo experiments. The following results are obtained from Monte Carlo simulations: Kapetanios and Shin’s (2003) $W^{\text{ave}}$ and $W^{\exp}$ statistics have better power for the three-regime TAR process with a relatively narrow band of a unit root process; Bec, Ben Salem, and Carrasco’s (2004) $\text{SupW}$ and Park and Shintani’s (2005) $\text{inf-t}$ statistics perform poorly under the three-regime TAR process with small threshold values even in comparison with the Dickey-Fuller test, whereas $\text{SupW}$ and $\text{inf-t}$ statistics dominate in the case of large threshold values; and $\text{SupW}$ performs best when the sample size and threshold increase and the outer regimes have a rapid convergence. In order to substantiate the use of our Monte Carlo results for some of the applied work, we apply these tests to the real exchange rates for many countries.

Keywords: Unit root test; three-regime TAR model; power

JEL Classification: C12; C22

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