

**UNIT ROOT TEST UNDER INNOVATION
OUTLIER CONTAMINATION
SMALL SAMPLE CASE**

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Abstract

The two sided unit root test of a first-order autoregressive model in the presence of an innovation outlier is considered. In this paper, we present three tests; two are usual and one is new. We give formulas computing the size and the power of the three tests when an innovation outlier (IO) occurs at a specified time, say k . Using a comparative study, we show that the new statistic performs better under contamination. A Small sample case is considered only.

Keywords: autoregressive process, Dickey-Fuller test, innovation outlier, power, size.

2000 Mathematics Subject Classification: Primary 62F11; Secondary 62M10.

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Received 11 February 2005