

SHOCKS (Do You Want to Identify Them?)

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Abstract:

The purpose of this paper is to develop time series econometric tools to identify and test what type of shocks are permanent and which ones are transitory. To achieve this, we introduce the Threshold Integrated Moving Average Models (TIMA). These models are based in two pillars: (1) The autoregressive part has a unit root, and (2) The moving average side has a threshold structure. Because at every “t” only one type of shock exist, these two elements are enough to achieve our goal. More concrete, in these models we can test for the existence of permanent and transitory shocks by testing the existence of a unit root in some of the regimes of the threshold moving average side. The paper fully develops the properties of TIMA models (stationarity-ergodicity, invertibility and its impulse response function) plus the asymptotic theory of LS estimators (consistency and asymptotic normality) sufficient to carry on the required inference (threshold versus no-threshold and unit root versus no unit root in any of the threshold moving average regimes). This is done for two key scenarios:

- (1) Observable threshold variable. The threshold regimes are driven by characteristics of the economy (recessions, expansions, first differences of the analyzed variable, etc)
- (2) Non-observable threshold variable. The threshold regimes are triggered by characteristics of the shocks (size, sign, etc).

While in the former scenario the asymptotic results are standard, square root of T convergence for the estimates of the slope parameters and T convergence for the threshold parameter, in the latter the discontinuity is such that the even the estimates of the slope parameters are T convergent.

The paper ends with a study of the finite sample properties of the tests proposed and an application to GNP where we introduce a new threshold permanent and transitory decomposition generated by TIMA models.

Current research is trying to generalize the obtained results to a bi-variate system.