

Prof. Robert M. de Jong
Ohio State University

Abstract

Anxious unit root processes,
by Jon Michel and Robert M. de Jong

This paper introduces a process, the “anxious unit root process”, that adds a constant to the standard unit root process whenever the unit root process exceeds a latent bound. The latent bound adjusts whenever such a jump occurs. The process can be viewed as one that generates endogenous structural changes, or as one that is reluctant or eager to go up whenever the latent bound is exceeded. Therefore, we try to model behavior that can be observed empirically in macro aggregates such as house prices. We show that the anxious unit root process satisfies an invariance principle. Two possibilities arise, depending on the choice of parameters. First, there is a situation in which weak dependence of first differences is obtained, and for this parameter choice, a standard unit root process with weakly dependent innovations is obtained. In the second situation, a nonstandard limit is obtained in the invariance principle. Therefore, in this second situation, proceeding as if the series satisfies a unit root and using techniques based on the unit root literature will be invalid.