“Testing for a shift in trend at an unknown date: a fixed-b analysis of heteroskedasticity autocorrelation robust OLS based tests”

This paper analyzes tests for a shift in the trend function of a time series at an unknown date based on ordinary least squares (OLS) estimates of the trend function. Inference about the trend parameters depends on the serial correlation structure of the data through the long run variance (zero frequency spectral density) of the errors. Asymptotically pivotal tests can be obtained by the use of serial correlation robust standard errors which require an estimate of the long run variance. The focus is on the class of nonparametric kernel estimators of the long run variance. Tests based on these estimators present two problems for practitioners. The first is the choice of kernel and bandwidth. The second is the well known over-rejection problem caused by strong serial correlation (or a possible unit root) in the errors. We provide solutions to both problems by using the fixed-b asymptotic framework of Kiefer and Vogelsang (2005, Econometric Theory) in conjunction with the scaling factor approach of Vogelsang (1998, Econometrica). Our results provide practitioners with a family of OLS based trend function structural change tests that are size robust to the presence of strong serial correlation or a unit root. Specific recommendations are provided for the tuning parameters (kernel and bandwidth) in a way that maximizes asymptotic integrated power.