

Testing for Structural Break in Cointegrated VAR Model

Abstract

Structural change can affect a stochastic or a deterministic component of the data generating process (DGP) which, in the simplest case, can be represented in the cointegrated VAR (CVAR) model by an appropriate binary variable. It can be shown that the introduction of the dummy into the cointegration space in the period t must be interpreted as the structural break in the DGP in the period $t-1$. On the other hand, if it is introduced into the cointegration space, the respective dummy must be simultaneously placed outside the cointegration space as well.

In order to test for the break affecting the deterministic component we employed the Wald statistic. The critical values and the power of the Wald test were simulated separately for the change of the constant, the trend break, and both. The experiments were designed for different sizes of the cointegrating space, number of variables, the span of the break, normally and t -distributed errors. In all cases the power of the test depends mostly on the magnitude of the break and the number of observations while other factors are of secondary importance. In order to test for the break at unknown time it is proposed to use the supWald statistic.

The cointegrated VAR with the structural break was used to explain the behavior of the Polish zloty/euro exchange rate. The structural break, which affects the deterministic component of the data generating process was found for the period of the beginning of the world financial crisis.

Keywords: structural breaks, cointegrated VAR, exchange rate modelling, WALD test, hypothesis testing

JEL: C1, C12, C32