

Bayesian Multivariate Beveridge–Nelson Decomposition of I(1) and I(2) Series with Cointegration*

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Abstract

The consumption Euler equation implies that the output growth rate and the real interest rate are of the same order of integration; thus if the real interest rate is I(1), then so is the output growth rate with possible cointegration, and log output is I(2). This paper extends the multivariate Beveridge–Nelson decomposition to such a case, and develops a Bayesian method to obtain error bands. The paper applies the method to US data to estimate the natural rates (or their permanent components) and gaps of output, inflation, interest, and unemployment jointly, and finds that the estimated gaps become much bigger if one allows for cointegration.

Keywords Natural rate, Output gap, Trend–cycle decomposition, Trend inflation, Unit root, Vector error correction model (VECM)

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