Seminar

A MODEL FOR COFRACTIONALITY WITHOUT THE GENERALIZED LAG OPERATOR

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Abstract
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A MODEL FOR COFRACTIONALITY WITHOUT THE GENERALIZED LAG OPERATOR*

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Abstract

We propose a fractionally cointegrated (or cofractional) vector autoregressive model that does not rely on the generalized lag operator introduced by Granger (1986) and Johansen (2008). We call the model fractional VECM, FVECM. We study the stability condition for the FVECM and prove that the model is coherent with the notion of fractional cointegration. Indeed, the FVECM admits a Granger representation of the solution that demonstrates the fractional and co-fractional properties. Moreover, the FVECM is identified for any combination of number of lags and cointegration rank. This solves all the identification problems associated with the FCVAR specification of Johansen (2008), see Carlini and Santucci de Magistris (2017). The cofractionality parameters of the FVECM can be estimated by profile maximum likelihood, based on the reduced rank regression of Johansen (1988, 1995). Building on the results of Johansen and Nielsen (2012), we prove consistency of the maximum likelihood estimator when errors are independent and identically distributed with suitable moment conditions and bounded initial values. We prove that the limit distribution of cointegration coefficients is mixed Gaussian, while for the remaining parameters it is Gaussian.

*Joint work with Federico Carlini