



## Tests for non-cointegration based on the frequency domain

Igor Viveiros Melo Souza

DECEG, UFOP and Departamento de Estatística, UFMG, Mariana-MG, Brazil - igorviveiros@gmail.com

Valderio Anselmo Reisen

Departamento de Estatística, UFES and PPGEA, UFES, Vitória, Brazil - valderioanselmoreisen@gmail.com

Glaura da Conceição Franco\*

Departamento de Estatística, UFMG, Belo Horizonte-MG, Brazil - glaura@est.ufmg.br

The aim of this paper is to propose methods to test the null hypothesis of non-cointegration in bivariate series based on the determinant of the spectral density matrix for the frequencies close to the origin. Two different statistics are proposed: the first one is based on a regression of logged determinant on a set of logged Fourier frequencies and the second statistic is the semiparametric averaged determinant estimator. In the study, series are assumed to be integrated of order one, that is, series are  $I(1)$ , and the order of integration of the error series is  $I(1 - b)$ ,  $b \in [0, 1]$ , that is, the parameter  $b$  determines the reduction in the order of integration of the error series. Besides, the determinant of the spectral density matrix for the first difference series is a power function of  $b$ . An advantage of the methods proposed here over the standard methods is that they allow to know the order of integration of the error series without estimating a regression equation. Methods discussed here possess correct size and good power for moderate sample sizes when compared with other proposals.

**Keywords:** Fractional cointegration; Determinant of spectral density matrix, Semiparametric estimator.