

# MULTIVARIATE GRAM-CHARLIER DENSITIES

by

Javier Perote\* and Esther B. del Brío

## Abstract:

This paper develops both univariate and multivariate distributions based on Gram-Charlier and Edgeworth expansions, attempting to ensure non negativity by exploiting the orthogonal properties of the Hermite polynomials. The article discusses the problems underlying some specifications (in particular those involving other conditional moments beyond the variance) and provides empirical examples comparing the performance of these positive definite densities to the univariate and multivariate versions of the so-called Edgeworth-Sargan distribution when fitting stock market indices. The fitted densities perform similarly and thus the use of the positive versions depends on other econometric considerations rather than on accuracy.

**Key words:** Gram-Charlier and Edgeworth expansions, conditional heteroskedasticity and kurtosis, financial data.

**JEL Classification:** C16, G1.

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\* Corresponding author: Universidad Rey Juan Carlos. Dept. de Economía Aplicada II y Fundamentos del Análisis Económico. Fac. de Ciencias Jurídicas y Sociales. Campus de Vicálvaro. Pº de los Artilleros s/n. 28032 Madrid (Spain). Tel: +34 91 4887684. E-mail: javier.perote@urjc.es