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Finding a maximum skewness portfolio—a general solution to three-moments portfolio choice☆

Gustavo M. de Athayde[a], Renato G. Flôres Jr.[b,*]

[a]Banco Itaù, Rua Boa Vista 176, São Paulo 01014-919, Brazil
[b]Escola de Pós-Graduação em Economia (EPGE)/Fundação Getulio Vargas, Praia de Botafogo 190, 11° andar, Rio de Janeiro 22253-900, Brazil

Abstract

Considering the three first moments and allowing short sales, the efficient portfolios set for n risky assets and a riskless one is found, supposing that agents like odd moments and dislike even ones. Analytical formulas for the solution surface are obtained and important geometric properties provide insights on its shape in the three-dimensional space defined by the moments. A special duality result is needed and proved. The methodology is general, comprising situations in which, for instance, the investor trades a negative skewness for a higher expected return. Computation of the optimum portfolio weights is feasible in most cases.

JEL classification: C49; C61; C63; G11

Keywords: Duality; Efficient set; Higher moments; Portfolio choice; Skewness

1. Introduction

Since at least Mandelbrot (1963), economists and practitioners as well have been aware that the distribution of asset returns very seldom is normal. In spite of the considerable empirical literature now taking into account this fact (e.g. Campbell

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* Corresponding author. Tel.: + 55-21-2559 5909; fax: + 55-21-2553 8822.
E-mail address: rflores@fgv.br (R.G. Flôres Jr.).

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