

**NONLINEAR DYNAMICS WITHIN MACROECONOMIC FACTORS AND
STOCK MARKET IN PORTUGAL, 1993-2003**

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Abstract

The main objective of this paper is to assess how mutual information as a measure of global dependence between stock markets and macroeconomic factors can overcome some of the weaknesses of the traditional linear approaches commonly used in this context. One of the advantages of mutual information is that it does not require any prior assumption regarding the specification of a theoretical probability distribution or the specification of the dependence model. This study focuses on the Portuguese stock market where we evaluate the relevance of the macroeconomic and financial variables as determinants of the stock prices behaviour.

JEL Classification: C14, C22, C32

Keywords: Nonlinear dependence, mutual information, macroeconomic and financial factors

1. Introduction

It is quite common to find in the financial literature theories and models based on the efficient market hypothesis, which implies that prediction and forecasting based on historical rates of return or other factors are not possible to perform in practice. This argument has been reinforced by empirical findings that stock prices follow a random walk process. Therefore, an alternative way to study the relationship between the economic activity represented by macroeconomic factors and the behaviour of prices in the stock market lies on the analysis of long-run trends based on monthly observations [Pesaran *et al.* (1995)].

Traditionally, the study of such links has been made on the basis of linear models. However, there are many authors that argue that this type of analysis is in general inconclusive because linear independence is not synonymous of independence, being thus necessary to ascertain the possibility of the existence of nonlinear dependence [Darbellay (1998); Maasoumi *et al.* (2002)].

This paper investigates the relationship between the behaviour of certain economic factors and the Portuguese stock market prices by means of linear and nonlinear approaches based upon traditional single equation linear models and global dependence tests (linear and nonlinear) using mutual information and the global correlation coefficient. The main goal is to access dependence in a global way, linear and nonlinear, and independently of any previously assumed model. In this context we use in this paper

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