

Nonlinear Serial Dependence in Saudi Stock Market: Testing the Weak-Form of the Efficient Markets Hypothesis

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Abstract

This paper investigates the existence of nonlinear serial dependence in the returns of one of the largest stock markets in the Middle East and North Africa; the Saudi Stock Exchange (SSE), using set of highly regarded nonlinear serial dependence tests. In addition, it attempts to validate the weak-form of the Efficient Market Hypothesis (EMH) based on nonlinear serial dependence tests after removing linearity effects from all of the data series. From the literature of nonlinearity, a set of highly regarded tests recommended by Brock, Hsieh and LeBaron (1991) have been used to detect nonlinearity and its source include; McLeod and Li (1983) portmanteau test, Engle (1982) Autoregressive conditional heteroscedasticity (ARCH) models, Tsay (1986) neglected nonlinearities Test, Brock et al (1996) BDSL test, and Hsieh (1989) third-order moment test to determine the source of nonlinearity. The study sample consists of individual stocks, sectoral index and the aggregate index as follows; Tadawul All-Shares Index (TASI) from 31 December 1999 to 1 January 2010 with a total of 2661 daily observations, the daily closing of Saudi Tadawul Banks and financial services (TDWBANK) from 19 April 2007 to 1 January 2010 with a total of 707 daily observations, the daily closing adjusted price of Saudi Arabia Basic Industries (SABIC) from 13 April 2000 to 1 January 2010 with a total of 2537 daily observations, the daily closing adjusted price of Saudi Telecommunication Company (STC) from 3 October 2005 to 1 January 2010 with a total of 1110 daily observations, the daily closing adjusted price of Savola Group from 4 July 2003 to 1 January 2010 with a total of 1696 daily observations. The purpose of selecting this data structure is to investigate Samuelson's dictum (1998) that the efficient markets hypothesis works much better for individual stocks than it does for the aggregate stock market index. The results indicate that the Saudi Stock Exchange (SSE) returns exhibit significant nonlinear serial dependence in addition to the linear dependence. The source of nonlinear serial dependence in the Saudi stock market returns has been attributed to nonlinear serial dependence in the conditional variance. The hypothesis of market efficiency has been strongly rejected based on the results from the nonlinear dependence tests, as it does from the results of linearity tests. Therefore, a conclusion has been reached that the Saudi stock market is inefficient in the weak-form of the Efficient Market Hypothesis (EMH). Nonetheless, the Saudi stock market needs to be studied further with different sample, time series, and other tests to verify market efficiency and nonlinearity.

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NB: References will be included in the full paper