Asymmetric transmission of long-run volatility in the stock market

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Abstract

The last two decades have been characterised by a growing interest in the application of nonlinear time series techniques to the analysis of financial data. Nowadays, ample empirical evidence has been gathered for both nonlinearity and structural changes in the dynamic properties of many observed time series. In this work, we employ models based on abrupt transition autoregressive (TAR and M-TAR) techniques in order to investigate the impact of volatility in the US stock returns on the volatility of stock returns in Portugal and Germany. The asymmetric effects both in the mean and variance render the behavior of financial time series a complex process which is difficult to be captured by linear models. While most researchers agree that volatility is predictable in many asset markets, what differs among them is how this prediction should be modeled. Variations are necessary to adapt the standard GARCH model to the need arising from examining the time series properties of specific issues in finance and economics. In recent years the evidence for predictability has led to a variety of approaches, among which the most interesting are the asymmetric volatility models. One of the established stylized facts of financial markets is that, generally, volatility after negative shocks is higher than volatility after positive shocks. The aim of this paper is to investigate the changes in the long-run asymmetric equilibrium relationships between two developed stock markets of different sizes (Portugal and Germany) by using the Enders and Siklos (2001) asymmetric threshold models TAR and M-TAR. The preliminary results show that there is evidence of asymmetric effects of the US volatility on the volatility of Portugal and Germany both in the TAR and M-TAR and that both deep and steep asymmetric movements co-exist in the volatility. Future work will be directed to analyze other nonlinear endogenous effects in these series and to expand the analysis to other world financial blocks.

Keywords

Stock market volatility, asymmetric transmission, endogeneity.