

Abstract

# PSI-20 and global indexes stock market efficiency

Miguel Palhoto Rodrigues

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This paper discusses the hypothesis that world financial markets indexes are efficient in their weak form, in the same way, it attempts to forecast the future prices of those indexes that demonstrate to be unefficient or efficient on random walk III form, while ARCH e GARCH processes are conducted. The main target is to test the hypothesis that those indexes are random walks I, II and III, following Campbell's methodology (1997).

To assess this, was tested the hypothesis that indexes are integrated stochastic processes, independent and identically distributed. Once this possibility was not proved, we tested the hypothesis that indexes are dependent processes but not auto-correlated in the first moments (martingales). In this approach augmented Dickey-Fuller, Ljung-Box, Breuch-Pagan and variance ratios statistical tests were conducted.

In result, the indexes that proved to be random walk III were plotted through the ARCH process. The indexes that proved to be unefficient were plotted through the GARCH process. The indexes future prices were simulated through the previous estimated models.

This investigation analysed the indexes from the following countries: Canada, United States, Mexico, Venezuela, China, South Chorea, Hong Kong, India, Indonesia, Philippines, Japan, New Zeland, Singapore, Thailand, Taiwan, Germany, Austria, Belgium, Denmark, Spain, Finland, France, Greece, Netherlands, Italy, Portugal, United Kindgom, Sweden, Hungry, Norway, Russia, Switzerland, Turkey, Egypt and Israel.

The results allow a characterization of those financial markets indexes according to 3 types of random walks.

The facts identified in the investigation indicate that financial markets weak efficiency hypothesis is closely connected with index dependence, return volatility or with the autocorrelation of the return's first moments.

The conclusions inferred lead to the presentation of 25 efficient indexes in the weak form: 5 random walks I, 4 random walks II and 16 random walks III. The remaining 15 indexes proved to be inefficient.

Thus, the 16 random walk III were plotted through the ARCH process while the 15 inefficient indexes were plotted through the GARCH process. By these models were simulated the indexes future prices.

**Keywords:** Random Walk I, II and III, Martingale, Efficiency, variance ratios, ARCH and GARCH.