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Periodic market closures and the long-range dependence phenomena in the Brazilian equity market

Daniel O. Cajueiro^a, Benjamin M. Tabak^{a,b,*},
Nathalia A. Souza^c

^a*Mestrado em Economia de Empresas, Universidade Católica de Brasília, SGAN 916, Módulo B, Asa Norte DF 70790-160, Brazil*

^b*Banco Central do Brasil - DEPEP SBS Quadra 3, Bloco B, ed. sede 9 andar, 70074-900, Brasília, DF, Brazil*

^c*Universidade de Brasília, Brazil*

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Abstract

This paper presents new empirical evidence of the effect of periodic market closures in financial markets which is not available in the literature yet. In particular, employing closing and opening prices, we have found that the intensity of the long-range dependence phenomena presented in this market depends on the time of the day that this phenomena is measured. This kind of pattern seems to be related to trading performed by different types of investors and the flow of information over the day.

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*Corresponding author. Mestrado em Economia de Empresas, Universidade Católica de Brasília, SGAN 916, Módulo B, Asa Norte DF 70790-160, Brazil.

E-mail address: benjamin.tabak@bcb.gov.br (B.M. Tabak).

1. Introduction

Most financial markets exhibit very rich patterns caused by cyclic closures of the trading process. Actually, market closures may impact on the financial system in three special ways: (a) they impede investors from trading in the market as soon as new public information arises; (b) they retard investors from learning about the financial system by taking market prices and trading activities into account; (c) they may segment the market due to the arising of different types of investors who feel more comfortable in trading in a given situation. In general, the lack of trading increases the risk of holding the stock over market closures, causing investors to reduce their position at the market close. Additionally, the lack of market prices as a source of information increases the asymmetry of information among investors in the closure period. On the other hand, the differences between trading near opening periods and trading near closing periods may be enough to segment the market by several types of investors. Moreover, there are some markets that allow electronic trading after the closing of the stock exchange. This kind of facility is specially useful for people who have other types of activity during the time of common trading or for investors who need a little more time to adjust their portfolios according to their needs.

In this context, many empirical findings related to periodic market closures have been registered in the literature: (a) Intraday mean return, volatility and trading volume are U-shaped [1–3], i.e., the high volatility (volume) of the open is followed by a decrease and again by an increase just before closing; (b) Open–open returns are more volatile than close–close returns [4–6], situation caused mainly because of the revelation of private information in trading. On the other hand, the arising of theoretical models was motivated to explain these findings. Some of these models may be found, for instance, in Refs. [7–9].

This paper presents new empirical evidence of the effect of periodic market closures in financial markets which is not in the available literature yet. In particular, employing closing and opening prices, we build a price index, which represents close–close and open–open returns, and also a price index that stands for open–close returns (a measure of the intraday return) and close–open returns (the latter from day t to day $t + 1$, which can be seen as an overnight return). We believe that differences in the long-range dependence phenomena intensity of these indices may be interpreted as a segmentation of the dynamics of the market by two main reasons: (a) Trading performed by different types of investors; (b) Different patterns of information caused by periodic market closures.

The data considered here is the same one considered in Ref. [10]. Actually, this paper can also be seen as an extension of the latter mentioned paper, since it also tries to explain the possible causes of the long-range dependence phenomena in the Brazilian equity returns.

The measure of long-range dependence used here is the Hurst's exponent which is evaluated by local Whittle method due to [11] which is a semi-parametric method that presents robustness to data seasonality [12] and short-range dependence.

The rest of the paper is divided as follows. The local Whittle estimator used here to evaluate the Hurst's exponent is introduced in Section 2. In Sections 3 and 4, a brief

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