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Stock exchange mergers and weak form of market efficiency: The case of Euronext Lisbon

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ABSTRACT

This exploratory paper is among the first to examine the impact of stock exchange mergers on informational market efficiency. We focus on the merger of Bolsa de Valores de Lisboa e Porto (Portuguese Stock Exchange) with Euronext in 2002 (that created Euronext Lisbon). To investigate this question we perform numerous statistical tests: serial correlation test (ACF test), runs test, unit root test (Kwiatkowski, Philips, Schmidt, & Shin, 1992), multiple variance ratio test (Chow & Denning, 1993) and ranks and signs test (Wright, 2000).
The results indicate that the Portuguese Equity Market is inefficient in weak form during pre-merger period implying that investors possessed an opportunity to earn abnormal returns though small in magnitude. The results, sensitive to the methodology used, indicate a mixed evidence of improvement in market efficiency during the post-merger period. Although the findings are mixed, yet most tests show a tendency of improved efficiency.
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1. Introduction

Past studies that examined the impact of stock exchanges merger focused only on the improvement of market liquidity (Nielsson, 2009) and the increase in corporate access to financing capital (Kokkoris & Olivares-Caminal, 2008). However, so far there has been no study that examined the impact of stock exchanges merger on market efficiency.

In this paper, we examine the impact of the merger between the Portuguese Stock Exchange with Euronext Lisbon (that created the Euronext Lisbon in 2002) on the market efficiency (Table 5).

The efficient market hypothesis relies on the premise that securities are fairly priced because at a given point in time security prices fully and instantaneously reflect all the relevant, past and current information. Investors can only expect to earn normal returns on their investments, in economic terms, zero economic profits. They cannot systematically earn abnormal returns, or positive economic profits, as securities trade at their fundamental intrinsic values. Stock prices move in a random manner, lacking any systematic patterns or dependencies. Consequently, investors cannot correctly predict the future prices of stocks and thus are unable to devise trading rules to earn abnormal returns. That is, stock price changes represent a random movement, i.e. random walk.

The examination of the behavior of Portuguese Stock Market returns, actually called Euronext Lisbon, in the context of a weak form efficient market, is an interesting subject not only for academics, but also, for practitioners and regulators as well. While academicians seek to understand the behavior of asset returns over time, practitioners and investors try to identify market

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imperfections to take financial advantages. In the case of the regulators, the situation is reverse: they want to increase the informational efficiency of the securities markets. Therefore, there is a considerable interest among a large number of groups to acquire the knowledge about the market efficiency — in our case the Portuguese Stock Market.

We differentiate our study from the rest of the literature due to several reasons including it is the first to investigate the impact of stock exchanges merger on market efficiency. Also we investigate the market efficiency question rigorously, in econometrics sense, utilizing a host of traditional and new tests: serial correlation test (ACF), runs test, unit root test, as well multiple variance ratio test (Chow & Denning, 1993) and the ranks and signs tests from Wright (2000).

Our results show that market portfolio returns explain only a small portion of the daily stock price changes in local firms. Comparing pre and post-merger periods, we find that in some cases the explanatory power of market returns increases but in others it decreases.

We also find that, in most cases, some serial correlation exists, though small in magnitude. After merger, serial correlation decreases for many companies particularly for lags 1 and 2. For some companies the sign changes and for some other companies there is a loss of statistical significance.

Runs test overall offer evidence of market inefficiency for the full sample and sub-samples during pre and post periods. Results in most cases show that prices move in a systematic pattern, producing significant runs. However, comparing results between post and pre-merger periods we find evidence of improvement of market efficiency.

Based on unit root test, Kwiatkowski, Philips, Schmidt, & Shin (1992) test, we find that most stocks from PSI-20 for the full sample are weak form efficient. In the post-merger period all stocks maintain their efficiency and some even demonstrate an improvement.

Based on multiple variation ratio test we find *that* random walk hypothesis is rejected for most of the firms. But after merger we find some improvements in market efficiency. We find similar results particularly in the post-merger period for Wright (2000) ranks and signs test. In some cases, we reject the random walk hypothesis but, in some other cases, we fail to reject the null hypothesis. Comparing the pre and post-merger periods, we observe that the number of firms, where we fail to reject the random walk hypotheses, increases but essentially in Lags 16 and 32. It seems that merger influences the efficiency but only in longer periods.

The next section summarizes the relevant literature review. Section 3 presents an overview of the Portuguese Stock Market and the relevant PSI-20 Index. Section 4 states the research questions and hypotheses. Section 5 describes the research questions and hypotheses. Section 6 offers the data and sample. Section 7 tests the market efficiency hypothesis, and Section 8 presents the conclusions.

2. Literature review

2.1. Stock exchange mergers

The study of the impact of stock exchange mergers on market efficiency is at an infancy stage. According to our knowledge, no study has yet examined the impact of the stock exchange mergers on the informational market efficiency. The exchange mergers research focuses essentially on the liquidity aspect. Nielsson (2009) analyses if the merger of Euronext with the stock exchanges in Amsterdam, Brussels, Lisbon and Paris increases the liquidity of large firm stocks and firms with foreign sales. He finds that the firms that operate in domestic markets do not experience an increase in stock liquidity upon mergers. Kokkoris and Olivares-Caminal (2008) discuss the financial benefits of stock exchange mergers and postulate that the EU merger of financial markets will benefit the corporate sector because it becomes easier for firms to access financing capital. They, among others, believe that EU stock exchange mergers would result in lower trading costs due to positive economies of scale and synergy effects.

2.2. Weak form market efficiency

Table 1 summarizes the key research on weak form of market efficiency around the world.

From the above table we note that there are only two studies which focus on Portugal. Worthington and Higgs (2004a), using the period from 1987 to 2003, examine the efficiency of Portuguese stock market. They find that the Portuguese Stock Market is inefficient. Areal and Armada (2002) find mixed result. Our study extends these two researches, using a more recent period (1998 to 2008) and comprehensive econometrics testing methods, traditional and recent.

3. Weak form market efficiency — what it is?

A market is considered as efficient if the price of an asset is an unbiased estimate of the true value of the asset. In an efficient market, prices are not necessarily equal to the true value all the time. Errors in the market prices must be unbiased, meaning that prices at certain moments can be higher or lower than the true value but this deviation from true value must be random. If the deviations from true value are random, at a given moment the probability that the stock price will be higher or lower than the true value of the asset will be equal. It is also necessary that the deviations from the true stock price will not be correlated.

Market efficiency can be categorized into three forms: weak form; semi-strong form and strong form. Weak form of efficiency assumes that actual price of an asset incorporates the past prices information. Thus, it will be not possible for investors – using

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