10. THE DEVELOPMENT OF THE ROMANIAN CAPITAL MARKET: EVIDENCES ON INFORMATION EFFICIENCY

Victor DRAGOTĂ[*]
Andreea STOIAN[**]
Daniel Traian PELE[***]
Eugen MITRICĂ[****]
Malik BENSAFTA[*****]

Abstract[1]

The Romanian capital market has considerably grown in the last decade. This study reveals new evidences regarding informational efficiency of this market. Applying Multiple Variance Ratio test to random walk hypothesis, assuming, on the one hand homoskedasticity, and on the other hand heteroskedasticity, it was found that for most of the stock prices the random walk hypothesis cannot be rejected. Consequently, the returns are not predictable by using the series of historical returns. Based on these results, there are not enough reasons to reject the Efficient Market Hypothesis in its weak form.

Keywords: information, capital markets, market efficiency, random walk, predictability of returns, Romania

JEL Classification: G14, P34

[*] *Ph.D., Professor, Academy of Economic Studies, Bucharest, Department of Finance, victordragota@yahoo.com, victor.dragota@fin.ase.ro.*

[**] *Ph.D., Lecturer, Academy of Economic Studies, Bucharest, Department of Finance, andreea.stoian@fin.ase.ro.*

[***] *Ph.D., Lecturer, Academy of Economic Studies, Bucharest, Department of Statistics and Econometrics, danpele@ase.ro, www.danielpele.ase.ro.*

[****] *Ph.D., Lecturer, Academy of Economic Studies, Bucharest, Department of Finance, eugen_mitrica@yahoo.com.*

[*****] *Ph.D., GERCIE, Université François Rabelais de Tours, malikbensafta@yahoo.fr.*

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1. Introduction

Efficient Market Hypothesis (EMH) represents one of the main issues in Financial Markets (see Fama, 1970, 1976, 1991). As long as a market is efficient, the financial resources are properly allocated within the economy. This subject is quite interesting for the European ex-communist emergent economies. Also, considering the few existing literature related to EMH in the European ex-communist countries, Romania's case enriches this literature.

In 2007, Romania became a member of the European Union. However, this state has to be analysed cautiously as long as the mechanisms of the markets and, especially, the financial markets, were disturbed for a very long period of time. It has to be taken into account that political agreements do not follow every time the facto state.

Historically, Romania evolved inconstantly over time. After it became independent (in 1877), Romania developed into one of the best performing countries in economic terms, at least in the region (at that time, the Romanian capital, Bucharest, was called "the little Paris"). In this context, comparatively to other countries the Bucharest Stock Exchange was founded very early, in December 1882, and it was closed only during the First World War (1914-1918). In June 1948, the nationalization of almost the entire private property determined the closing of the Bucharest Stock Exchange (Anghelache, 2004), which was re-opened in 1995.

Moreover, for this country, the Communist period (1947-1989) was preceded by other events that also influenced the investors' behaviour. Thus, it must be considered that between 1941 and 1945, Romania was taking part in the Second World War, and after 1945 was under the USSR's influence. Moreover, before the Second World War, Romania was under a royal dictatorship (1938-1940) and, during the war, it became a fascist country (1940-1941). After the Second World War, most of the population, which had no relations to capitalism, was exterminated or marginalized over the Communist period (1947-1989). Consequently, it can be concluded that the Romanian people were almost unfamiliar with the market economy system. This state was also determined by the limited access to the information related to the market economy instruments. Moreover, some of the mechanisms of market economy are still not functional even today.

One different issue that can offer some explanations regarding the evolution of capital market is related to the attitude of the Romanian people against the communism. After some years of resistance, Romania became much concealed towards the "values" of communism. The response of the Romanian citizens was to adapt to the communist "values", survival being their main purpose. For instance, the level of production in almost each report was overvalued; the black market evolved, and so on.

Nowadays, the Romanian investors are influenced by the legacy inherited from the past system, from the point of view of mentality and culture. There are some features of their behaviour that might have a significant impact upon the Romanian capital market, too. For instance, the desire to become wealthy fast generates some speculative behaviour on the financial market. Investors have no patience in waiting for long-run gains, but they want earnings as fast as possible. They, in most cases, do not take into consideration the fundamental valuation of assets. Another issue is related to poor corporate governance principles and minority shareholders' protection. Managers do not fully understand the fact that the companies' financial resources can be represented by the stocks bought by a number of small investors who become minority shareholders. Most of the Romanian companies do not pay dividends or, even if they do, their size is strongly reduced. Consequently, it can be noticed the Romanian investors' reluctance against the long-run gains, and their will to earn some money from speculative transactions.

Given these facts, financial markets had specific features for the communist regime. In fact, it is quite hard to consider a "real" Romanian financial system during the communist regime. According to Ben–Ner and Montias (1994), 'unlike other East European countries, Romania had no decentralized decision-making at the level of government-owned firms, had no significant private sector, and did not rely on markets to a meaningful extent'. Consequently, there was no need for a complex financial system and the few existing financial institutions were suitable to the necessities of a fully state-owned economy. Actually, during the communist period the financial system was limited to few fully state-owned banks and the capital market totally disappeared. Because of the centralized economy, on the one hand, there were no private initiative and private investments and, consequently, there was no need of capital to finance them and, on the other hand, there were no private funds available. The last feature maintained over most of the transition period and it was the main reason for lack of liquidity of the BSE.

After 1989, fundamental changes were gradually made at the level of the existing financial institutions. National Bank of Romania became the central bank, independent of the government. The existing state-owned commercial banks started to be much more market oriented, according to the financing needs of a market economy. Based on the same principles, the Bucharest Stock Exchange was re-opened in 1995.

Formally, nowadays the capital market in Romania is organized under a system derived from the US capital market system. The regulatory and monitoring authority is the National Securities Commission (NSC) similar to the US Securities and Exchange Commission. The main capital market is split into two parts: the Bucharest Stock Exchange (BSE) and the electronic OTC market based on negotiation between dealers (RASDAQ), which is similar to the US NASDAQ. These parts merged under the BSE authority at the end of 2005 but, from the point of view of the securities traded, they remained independent. Mainly, the securities traded on BSE and RASDAQ are shares, but also few local municipality bonds are traded (16 listed in April 2008) and very few corporate bonds (6 listed in April 2008). The shares listed on the BSE are divided into three tiers, depending on the liquidity of shares and on the other features of issuer companies. The total number of shares traded in all the three tires in April 2008 was 61 (21 – 1st tier, 39 – 2nd tier, 1 – 3rd tier). The trading volume increased by almost 20 times between 2000 (April) and 2008 (April), and the trading value increased by almost 300 times. The number of licensed intermediaries expanded to 75.

In April 2008, the Bucharest Stock Exchange (including RASDAQ) general trends were reflected by 7 indices: BET - index of the most liquid 10 companies listed on the BSE regulated market; BET-C - which reflects the price movement of all the companies listed on the BSE regulated market, on the 1st and on the 2nd tiers, except for the SIFs; BET-FI – the index which reveals the price movements of the investment funds (SIFs) traded on the BSE regulated market; ROTX – which reflects in real time the price movement of "blue chip" companies traded on the BSE market, being disseminated in real time by the Wiener Borse; RASDAQ Composite Index – the price index of all stocks traded on RASDAQ; RAQ-I – that reveals the price movement of stocks listed on the first category of this market and RAQ-II – which reflects the price movement of stocks listed on the second category of this market.

This paper deals with testing the information efficiency of the Romanian capital market. Two main issues have to be considered, respectively: *(i) Can the financial markets naturally return to the normal mechanisms that make them work (in a market economy) after a long period of inactivity?,* and *(ii) Assuming the answer to the first question is positive, how long is it going to take the financial markets to return to the mechanism of the market economy?*.

The rest of the paper is structured as follows. Section 2 presents the main theoretical aspects referring to information efficiency of capital markets, the methodology, and database. Section 3 presents empirical results of the investigation of information efficiency of Romanian capital market, and Section 4 concludes this study.

2. Theoretical background on testing information efficiency

Basically, a market is defined to be information-efficient if *no investors can reach abnormal systematic earnings and, also, the true expected return of any security is equal to its equilibrium expected value* (Fama, 1976). From the first point of view, the main concern for the market is to give equal chances to each investor, which means that there are not investors able to gain every time and investors who loose every time. From the second opinion, it is important for markets to work, thing that will have as a result a right estimation of asset returns. In this context, there were many trials to develop instruments for testing market information efficiency.

One should note that the literature mainstream is concerned with the first approach, namely to analyze the possibility that some investors might reach systematic abnormal earnings. Many investigation techniques used in order to test the possibility of earning abnormal returns were revealed. In this sense, for example, Kendall (1953) and Alexander (1961) turned to tests of the serial correlation; Fama and Blume (1966) appealed to simple trading rules tests; Jegadeesh (1990) and Jegadeesh and Titman (1993) resorted to overreaction tests; DeBondt and Thaler (1985), Poterba and Summers (1988) and Fama and French (1988) fell back upon tests of long-horizon return predictability. There are, also, studies that concentrate on price adjustments after events issue. In that sense, among others, Pettit (1972), Asquith and Mullins (1983) and Michaely, Thaler and Womack (1995) studied the effect of the first announcement of dividends; Aharony and Swary (1980) and Kalay and Loewenstein (1986) analyzed the impact of the decrease/increase in dividend payments.

Campbell, Lo and MacKinlay (1997) stated that “any test of efficiency must assume an equilibrium model that defines normal security returns. If efficiency hypothesis is rejected, this can be because the market is truly inefficient or *because an incorrect* *equilibrium model has been assumed*". Also, De Long *et al*. (1990) stated that, given the fact that the noise traders that act on the market are making unpredictable decisions, prices can be significantly different from the fundamental values. In this context, it is relatively difficult to prove the existing differences between a fair market value and a current price for assets as long as these values are based on current expectations for future earnings. Fama (1970) stated that a market is information efficient if prices always fully reflect all the available information. The prices of stocks can follow a random walk, but this random walk can be completely independent of the relevant available information. If prices do not fully reflect all available information the market can over- or under-react to inaccurate information. For example, an unexpected increase in an issuer's reported earnings cannot be followed by an increase in stock prices, or can be followed by an insignificant increase in stock prices. Therefore, one issue still remains: do the stock prices fully reflect their intrinsic value? This approach was followed by Shiller (1981), Grossman and Shiller (1981), Shleifer and Summers (1990), which focused their studies on the informational significance of the stocks prices.

At least within the emerging markets, such as East European Ex-communist Countries, due to some of their particular features, such as lack of liquidity, econometric tests could be distorted (see Pele and Voineagu, 2008). The main issue in order to confirm whether there is a large difference between the securities market price and their fair value comes from the reliability of the model used to derive the fair value. If this model is unreliable or not appropriate, the market price can reflect the "true" value, but due to this fact it cannot be identified as the "true" value (Dragotă and Mitrică, 2004). In this case, even if it is empirically found that the asset price follows a random walk, although this price might not reflect a value based on rational assumptions. For instance, in many cases of shares issued by conversion of the reserves and surplus of the company the market price increased, which confirms that the Romanian investors' ability to valuate assets is quite deficient, and also doubts arises on the significance of econometric tests which have been run in order to prove the market efficiency hypothesis.

The informational efficiency of the Romanian capital market was differently tested in the past years. From this point of view, most of the studies were related to the possibility of gaining abnormal earnings (see Dragotă, Căruntu, and Stoian, 2006 for a survey). However, these studies analyzed past periods (for example, Dragotă and Mitrică, 2004, studied 6 best liquidity assets listed for the first tier of BSE during April 9th, 1998–October 10th, 2000).

As long as the conditions on the market have fundamentally changed in the past years, this present study proposes a necessary development of former studies related to the Romanian capital market in order to analyse the information efficiency evolution. Moreover, the database analyzed in the study is larger because it covers a longer period.

Similar studies were done for other ex-communist countries. For instance, Chun (2000), based on variance ratio tests found that the Hungarian capital market was weakly efficient; Gilmore and McManus (2003) investigated informational efficiency in its weak form for the Czech Republic, Poland and Hungary, within 1995-2000, and rejected the random walk hypothesis based on the results of a model comparison approach.

It is worth noticing that this paper concentrates on the ability of some investors to obtain systematic abnormal returns. In other words, the main concern is the predictability of returns (that is, *the weak form of efficiency*) even the studies for developed markets test the semi-strong or the strong form of efficiency. The reason for this approach is very simple, considering the emerging state of the Romanian capital market in the present. Moreover, it is considered that the fair game is a basic condition in order to develop the market in a proper manner.

The analysis of the fulfilment of the weak form of information efficiency conditions is equivalent to verify if the current stock prices reflect the whole past history contained in the stock prices. If this condition is fulfilled, then no investor will be able to obtain excessive earnings (abnormal returns) by analyzing the past prices – that is, all historical information on prices is reflected by the current price.

The notion of market efficiency can be as follows: the more efficient the market is, the more aleatory the sequence of price changes generated by the market is. Consequently, the statistical manner to express the market efficiency is the random walk hypothesis (RWH), which can be formulated in three different models, respectively: (i) independently and identically distributed (IID) innovations (RWH1); (ii) independent innovations (RWH2); (iii) uncorrelated innovations (RWH3). Here are briefly introduced only the first and the third form of the RWH, the reason being related to the manner of statistical validation of these hypotheses.

The classical approach to formalize the random walk hypothesis (RWH1) is the model:

$$p_t = \mu + p_{t-1} + \varepsilon_t \qquad [1]$$

where the increments (innovations) $\varepsilon_t \sim \boldsymbol{WN}(0,\sigma^2)$ denote a white noise, with independently and identically distributed variables.

$$\begin{cases} \mathbf{E}[\varepsilon_t] = 0, \forall t \\ \mathbf{Var}\left[\varepsilon_t\right] = \sigma^2, \forall t \\ \varepsilon_t \text{ and } \varepsilon_{t+k} \text{ are independent variables}, \forall k \neq 0 \end{cases}.$$

In equation [1], p_t, p_{t-1} represent stock log prices at two successive moments and μ is the expected price change, also called drift.

In order to simplify the aspects related to the inference problem, one common approach is to assume a Gaussian white noise satisfying the above conditions.

Since in the normal distribution negative values can occur, one may attempt to find negative prices, which is unrealistic. For this reason, the logarithm of price is used instead of stock price: $p_t = \log P_t$, where log denotes natural logarithm; log prices are also needed for variance stationarity of returns.

The weakest form of random walk hypothesis (RWH3) results by considering processes with dependent but uncorrelated innovations. The RWH3 model is:

$$p_t = \mu + p_{t-1} + \varepsilon_t \qquad [2]$$

where the innovations $(\varepsilon_t)_t$ have the following properties:

$$\begin{cases} \mathbf{E}[\varepsilon_t] = 0, \forall t \\ \mathbf{Var}\left[\varepsilon_t\right] = \sigma_t^2, \forall t \\ \mathbf{Cov}\left[\varepsilon_t, \varepsilon_{t+k}\right] = 0, \forall k \neq 0 \\ \mathbf{Cov}\left[\varepsilon_t{}^2, \varepsilon_{t+k}{}^2\right] \neq 0, \forall k \neq 0 \end{cases}$$

As stated before, the aim of this paper is to investigate information efficiency of the Romanian capital market in its weak form, based on a set of empirical tests of random walk hypothesis (see, also, Campbell, Lo and MacKinlay, 1997). Consequently, a short review of the main tests used in this study is presented.

Cowles-Jones (1937) test is a simple and powerful test for investigating random walk hypothesis. Thus, it is considered that the log prices follow a random walk model without drift, like in RWH1:

$$p_t = p_{t-1} + \varepsilon_t \text{, where } (\varepsilon_t)_t \sim IID(0, \sigma^2).$$

Let I_t be the indicator variable of returns, defined as follows:

$$I_t = \begin{cases} 1, \text{ if } r_t \equiv p_t - p_{t-1} > 0 \\ 0, \text{ if } r_t \equiv p_t - p_{t-1} \leq 0 \end{cases}.$$

The basic idea is to compare the number of sequences with the number of reversals. If the returns r_t and r_{t-1} have the same sign, then this is called a sequence; if the returns r_t and r_{t-1} have different signs, then this is called a reversal. Under these circumstances, the Cowles-Jones ratio (CJ) is defined as the ratio of number of sequences to the number of reversals. If log-prices follow a driftless random walk, and the distribution of the ε's is symmetric, then positive and negative increments are equally likely, and the CJ ratio should be approximately one.

In order to test the RWH1 using the CJ ratio a simple z-statistic was used: $z = \dfrac{CJ - 1}{SE(CJ)}$, where SE represents standard error of the CJ ratio (see Campbell, Lo, MacKinlay, 1997).

Unfortunately, the Cowles-Jones ratio is not such a powerful test: to reject the random walk almost a ¾ chance of prices going up (or down) every year is necessary to detect deviations from a random walk with this test.

Runs test can help detect whether the RW1 hypothesis can be rejected. Thus, it was considered the log prices follow a random walk model without drift, like in RWH1:

$$p_t = p_{t-1} + \varepsilon_t \text{, where } (\varepsilon_t)_t \sim IID(0, \sigma^2).$$

Let I_t be the indicator variable of returns, defined above.

If a sequence of 8 returns is considered, this can be represented using the indicator variable I_t as follows: 11000111. A sequence of consecutive 0 or 1 denotes a run. For the time series of historical returns, the number of runs can be computed and will be compared with the expected number of runs under the random walk hypothesis. The main idea is to compare the actual number of runs with the expected one under the random walk hypothesis.

In order to test the RW1 hypothesis, the sampling distribution of the total number of runs is necessary. Such a distribution was proposed by Mood (1940) under a more general context. Again, a z-statistic to compare the actual number of runs with the expected number of runs under the random walk hypothesis will be computed (for details, see Campbell, Lo and MacKinlay, 1997).

Variance ratio test is one of the most relevant for testing the random walk behaviour of a time series. If such a series follows a random walk model then variance of a two-period continuously compounded return must be twice the variance of one period return (Campbell, Lo and MacKinlay, 1997). Thus, if q periods are considered then the variance ratio $VR(q)=\frac{Var(r_t(q))}{qVar(r_t)}$ should equal 1, where

$$r_t(q)=r_t+r_{t-1}+...+r_{t-q+1}.$$

Following Lo and MacKinlay (1988) and Campbell, Lo and MacKinlay (1997), two forms of variance ratio were used in order to test the RW1 and RW3 hypotheses accordingly.

For testing the RW1 hypothesis, assuming homoskedasticity and independent innovations, the following test statistics was used:

$$\psi(q)=\frac{\sqrt{nq}(VR(q)-1)}{\sqrt{\frac{2(2q-1)(q-1)}{3q}}}\sim \boldsymbol{N(0,1)}$$

where the price series are supposed to have *nq+1* observations, $p_0,...,p_{nq}$, and variance ratio is computed using the methodology from Campbell, Lo and MacKinlay (1997).

For testing the RWH3, assuming heteroskedasticity and uncorrelated increments, the following test statistic was used:

$$\psi^*(q)=\frac{\sqrt{nq}(VR(q)-1)}{\sqrt{\hat{\theta}(q)}}\sim \boldsymbol{N(0,1)},$$

where $\hat{\theta}(q)$ is a heteroskedasticity-consistent estimator of $\theta(q)$, the asymptotical variance of *VR(q).*

Both statistics for the RWH1 and the RWH3 were calculated, taking into account 4 values for *q: 2, 4, 8,* and *16*.

In order to make a decision regarding the acceptance or the rejection of the random walk hypothesis, the Multiple Variance Ratio approach (MVR) was used (Chow and Denning, 1993). Thus, if a set of variance ratios, $VR(q_1),....VR(q_m)$ is considered, where *m* is the number of aggregated periods to form variance ratio and $q_i \neq q_j$ for $i \neq j$. Then, under the random walk hypothesis, a set of *q* sub-hypothesis was tested:

$$\begin{cases} H_{0i} : VR(q_i) = 1 \\ H_{Ai} : VR(q_i) \neq 1 \end{cases}.$$

Let $\{\psi(q_1),...,\psi(q_m)\}$ be the set of *z*-statistics for RWH1 and let $\{\psi^*(q_1),...,\psi^*(q_m)\}$ be the set of *z*-statistics for RWH3. Then, if is denoted by $M\psi = \max_{i=1..m}|\psi(q_i)|$ and by $M\psi^* = \max_{i=1..m}|\psi(q_i)|$ the random walk hypothesis will be rejected if $|M\psi| > SMM(\alpha,m,\infty)$ or $|M\psi^*| > SMM(\alpha,m,\infty)$, where $SMM(\alpha,m,\infty)$ is the asymptotical critical value of the Studentized Maximum Modulus distribution with parameter *m* and ∞ degrees of freedom.

In fact, this critical value can be computed by using standard normal distribution:

$$SMM(\alpha,m,\infty) = z_{\alpha^+/2}$$

where $\alpha^+ = 1-(1-\alpha)^{1/m}$.

In this case, using $\alpha = 0.05$ significance level and having *m=4* periods, the critical value is $SMM(\alpha,m,\infty) = 2.49$.

In fact, this is the critical value for sample sizes larger than 120; for daily data, as in this study, the number of observations is far larger than this value. However, for the weekly data, the number of observations is close to 120 and the critical value is approximately equal to 2.49.

Further, we proceeded to investigating the weak information efficiency of the Romanian capital market based on the tests discussed above and by using a database that consists in daily and weekly returns for 18 companies listed on the first tier of the Bucharest Stock Exchange and in daily and weekly market returns estimated by using the indexes of the Romanian capital market[2]. For each asset, the period from the first listing until the end of 2006 was taken into account. For market indexes, the period from the construction of the index to the end of 2006 was taken into account. The closing prices for daily observations were used. The weekly returns were calculated as natural logarithm of Wednesday stock closing price ratio[3]. Consequently, the effects of Monday and Friday were also removed.

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[2] *All the details about the database we have used and, also, the results of the statistical tests, can be found on the web page http://danielpele.ase.ro/index_files/appendix.pdf.*

[3] *The return does not include the dividend yield; it is based only on price variation. The reason is the fact that in Romania the dividend payments are of a very low level, so an investor might neglect them. Moreover, accounting for dividend payments in returns will generate abnormal returns for some periods.*

It was chosen to investigate information efficiency on weekly returns because week-end days might distort the daily returns, but also because the Monday rate of return is not a realistic daily return.

The empirical results are presented and discussed in the section below.

3. Empirical results

In order to analyze the weak information efficiency of the Romanian capital market based on the random walk hypothesis, several tests were performed, namely: (i) Cowles-Jones test-sequences and reversals ratio, with drift or no drift, depending on the z-statistic values estimated in that sense; (ii) Runs tests, and (iii) Multiple Variance Ratio test (MVR). Beside the main tests, descriptive statistics for distribution probability of daily and weekly returns and short term auto-correlation coefficients were also estimated, which provide some insights referring to the possibility of obtaining abnormal returns on the Romanian capital market. Non-normality estimates were conducted first and followed by random walk tests.

Descriptive statistics and Jarque-Bera Statistics show that daily and weekly returns do not follow a normal distribution. Empirical evidence of the non-normality of returns distribution was well established within the main stream of literature by Mandelbrot (1963). Moreover, Hsieh (1988) emphasized that the distribution of daily returns was approximately symmetric and leptokurtic, similar to the state of the Romanian capital market. According to several studies (see, for a review, Zhou, 1996), one explanation for the fat-tailed distribution is the hypothesis that returns are independently distributed as normal distributions with changing mean and variance over time (heteroskedasticity is another cause of fat-tailed empirical distribution). Such mixed distributions could be the results of the existence of different types of investors on capital market, rational and noise traders, which can imply some informational asymmetry and, consequently, this reflects market informational inefficiency (inefficiency is also founded because of second moment order dependences).

Furthermore, the results for short term correlation coefficients denote weak autocorrelation in daily and weekly returns. Based on the results discussed above, it is difficult to state if the Romanian capital market is informational efficient in its weak form. On the one hand, the mixed distribution of returns could indicate the existence of two different categories of investors, which generates some informational asymmetry and, consequently, there are investors who systematically gain or loose. On the other hand, just knowing the past evolution of returns is not enough for investors to obtain abnormal returns, especially because of the transaction costs. Therefore, in order to reach a relevant conclusion about the informational efficiency of Romanian capital market better tests were applied. Thus, sequences and reversals ratio, Runs tests, and MVR were used. Even if Cowles-Jones ratio and Runs tests are less relevant as compared to MVR, they were applied in order to have some insights into the random walk hypothesis for daily and weekly returns. As indicated by the results obtained, it is still difficult to conclude whether prices follow a random walk model, due to the fact that there is some inconsistency between the two tests applied. For instance, in the case of daily returns there are only a few cases where evidences for random walk hypothesis were found, but they were rejected by all the companies, based on sequences and reversals ratio. On the other hand, for weekly returns, the state is much more unclear.

The Multiple Variance Ratio test, applied for daily and weekly data in order to test the RW1 or the RW3 hypotheses, reveals that there are some cases where the RW3 hypothesis could not be rejected. For instance, RWH1 is rejected in 15 cases out of 23 (including market indices) for daily data, and in 7 for weekly data, and, respectively, RWH3 is rejected in 14 cases for daily returns (10 cases for single companies) and in 2 cases for weekly returns. Rejecting the RW1 hypothesis does not denote the lack of information efficiency of the Romanian capital market; it just reflects that independency and constant distribution constraints of data over time are not fulfilled. Therefore, in most cases the RW3 hypothesis could not be rejected under less restrictive constraints for probability distribution of returns. Another observation is that in the cases of rejection, the results were close to the critical value.

Consequently, it was found that on the Romanian capital market returns follow a random walk movement. Nevertheless, there are some issues to be discussed:

(i) It is a clear evidence that random walk hypothesis is not rejected for more cases of weekly returns as compared to daily data. One possible explanation could reside in the fact that daily returns incorporate more variation than the weekly returns and the weekly data are smoother than the daily data.

(ii) In the case of the market index, the random walk hypothesis is rejected; even it could not be rejected for most of the companies from its composition (see for instance, BET, BETC and BET-FI). One explanation can arise from Working (1960), who argues that autocorrelation will be induced when using averages instead of the original values of a time series. As the market index is a weighted average of companies' prices, it that individual companies' returns can be expected to be more aleatory than the market index.

A synthesis of these tests is presented in Table 1.

Table 1

A synthesis of tests on market efficiency

	Number of companies	Number of companies where RWH was rejected	Number of indexes	Number of indexes where RWH was rejected
MVR Test for daily returns (assuming homoskedasticity)	19	11	4	4
MVR Test for weekly returns (assuming homoskedasticity)	18	3	4	3
MVR Test for daily returns (assuming heteroskedasticity)	19	10	4	4
MVR Test for weekly returns (assuming heteroskedasticity)	18	0	4	2

4. Conclusions

The Romanian economy has considerably grown in the last decade. Related to the development of a functioning market economy, one important issue is the expansion of the capital market, and its efficiency.

Referring to Dragotă and Mitrică (2004), this study covers a larger period, takes into consideration more companies and applies other statistical tests, considered more relevant. If compared to Pele and Voineagu (2008), which covers a largely period, this study takes into account not only the indexes, but the assets, too.

Based on the Multiple Variance Ratio test for random walk hypothesis, assuming, on the one hand, homoskedasticity, and, on the other hand, heteroskedasticity, for most stocks it was found that the hypothesis according to which the stock prices follow a random walk cannot be rejected. Consequently, the returns do not appear to be predictable using only the information set containing the past prices. On the basis of the results obtained, the Efficient Market Hypothesis in its weak form cannot be rejected. In this context, it has to be concluded that the Romanian capital market returns to normal mechanisms that make it work, even after a long period of inactivity.

These results sustain the hypothesis that the Romanian capital market improved its performance over the last few years. Also, the Romanian investors' professional experience increased and, probably, their ability to evaluate assets in an appropriate manner has developed. If compared to previous studies (see Dragotă and Mitrică, 2004), which analyzed the 1998-2000 period, the results of this study emphasize an improvement of market efficiency in less than six years. These are good news related to the fair game on Romanian capital market, which is in accordance with Pele and Voineagu (2008) conclusions.

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