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Zarządzanie finansami firm – teoria i praktyka

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CAN STOCK SPLITS GENERATE ABNORMAL STOCK PERFORMANCE IN POST-CRISIS ERA? EVIDENCE FROM THE NEW YORK STOCK EXCHANGE

Summary: Stock splits have puzzled researchers and practitioners for a very long time. I consider the stock splits performed between 2009 and May 2011 inclusive by companies listed on the New York Stock Exchange. In particular, I examine whether the shareholders' wealth is changed as a result of the stock-split event as of the split execution day and in the event window [40;+40] using Mean Adjusted Return Method and Market Model Method. The results obtained indicate no significant abnormal rates of return on the split date. Furthermore, I find shareholders' wealth deterioration in the aftermath of the split after reporting a decline in the cumulative abnormal rates of return by 9.80% and 5.49% under both methods, respectively, all 1-percent significant. Moreover, I document a slippage in the volatility as measured with the standard deviation of abnormal rates of return by 26.98% and 6.04%, respectively. Summarizing, as opposed to the market efficiency hypothesis stock splits alter some of the stock's characteristics even though they are expected to increase only the number of shares outstanding.

Keywords: stock split, abnormal rate of return, shareholders' wealth.

1. Introduction

Although stock splits have received a significant interest from researchers and practitioners they have remained a puzzling phenomenon in equity markets that deserves further examination. Despite their simplicity boiling down into splitting the capital into a greater number of stocks that are assigned with lower values proportionally to the split ratio the literature abounds with numerous examples of a particular reaction to the news of split announcement or the actual split date. At the end, equity holders own more shares that constitute the same percentage of the firm's value.

The anomalies accompanying the ex date, i.e. split execution date, reported by many researchers are even more pronounced as compared to the announcement-day effect and, by the same token, more surprising since the execution date is well known in advance. Put it in other words: the stock price or future cash flows should not, at least theoretically, change as a reaction to splitting the shares by efficient market as-

sumption. On the other hand, stock splits imply some of the costs, e.g. the fees to be settled to the stock exchange on which the company is listed, costs of the materials announcing this corporate event, etc.

One could pose a question why some 10% of the companies [Desai et al. 1998] decide to split their stocks taking into account all of the expenses associated with this “cosmetic event”. One plausible explanation which can be expected is enhanced liquidity achieved by attracting more small investors after bringing the stock price into “optimal trading range”. Other researchers postulate that stock splits can be used as a mean to convey private information of managers to the shareholders thus narrowing the information asymmetry. Further, there exists the evidence that management of the companies that do not capture much attention from analysts or the capital market at large, i.e. so called *neglected firms*, tend to split the stock awaiting more interest and as a result for instance enhanced liquidity.

More recently, there has emerged some new explanations that complement the traditional rationale staying behind stock splits, e.g. the commission-induced sponsorship hypothesis that posits that the bid-ask spread widens following a stock-split event hence encouraging brokers to promote that stock. Another one links the change in subsequent price performance to the stock characteristics like the change in ownership composition. According to this rationale the splitter benefits not only from enhanced liquidity and/or reduced cost of trading resulting from increased clientele base but also, as some of the researchers claim, from more dispersed ownership structure that translates into greater power of managers when being under a hostile takeover threat.

Regardless of managers’ motivations that underlie the decision of a stock split more and more research studies document some regularities around split announcement date or the actual split date, for instance with respect to changes in risk-return profile or proxies of liquidity, inter alia bid-ask spread, share volume or number of trades. In sum, in spite of their algebraic simplicity roughly boiling down to the change in the number of shares outstanding stock splits can influence several stock characteristics including the wealth of shareholders of splitting firms. There exists also evidence on the impact of stock splits on subsequent stock performance from other European capital markets [Rudnicki 2011].

The paper is organized as follows: there is presented the review of the existing literature in section 2, then the sample and methods employed and results and conclusions are included in section 4.

2. Review of the literature

[Ikenberry et al. 1996] find for their sample composed of 1,275 two-for-one stock-split events recorded for the companies listed on NYSE (New York Stock Exchange) or AMEX (American Stock Exchange) between 1975 and 1990 a 1-percent significant abnormal rate of return at the level of 7.93% and 12.15% in the first and three

years following the split, respectively. The split events are viewed as more probable for the stocks that sell at relatively high prices. In particular, four out of five stocks under consideration experienced a considerable positive stock price drift in the month preceding the stock split announcement. Moreover, they observe announcement-date-induced excess return equaling 3.38% and interpret this result as an evidence of market under reaction to this event. [Ikenberry et al. 1996] link the results received to self-selection explanation of stock splits, i.e. the authors argue that the stock splits were tapped to shift the stock price into more preferable trading range in order to improve the liquidity. On the other hand, the decision when to split the shares hinges on the managers' perception about the future performance of the company. Summarizing, [Ikenberry et al. 1996] point out that the price run-up is negatively related to the post-split abnormal returns.

Based on the sample of 235 two-for-one stock-split events concluded between April 1993 and March 1994 by companies listed on Nasdaq (National Association of Securities Dealers Automated Quotations), NYSE or AMEX [Schultz 2000, p. 449] reports that after splitting the stock one may observe relatively large number of small orders. More interestingly, amid these orders prevail buy orders what supports trading range hypothesis due to improved liquidity and/or a greater interest of small investors, often-times perceived as uninformed market participants or are dubbed *liquidity providers*. Moreover, increased shareholder base underpins the clientele hypothesis because of the influx of *liquidity providers*. Furthermore, [Schultz 2000, p. 449] document that overwhelming majority of effective spreads, i.e. those related to the stock price, climb following the split what entails a more profitable market making. Equivalently, brokers are provided with more incentives to promote the splitting firms' stock. [Schultz 2000, p. 449] concludes that the results obtained are supportive of the commission-induced sponsorship hypothesis.

According to the study of [Desai, Jain 1997, p. 431] in the wake of the split announcement one may observe a 7.11% positive abnormal rate of return for a sample comprised of 5,596 stock-split events from the period of 1971 and 1996. The authors find post-announcement 7.05% and 11.87% buy-and-hold abnormal returns in the first year and over a 3-year time period, respectively, all statistically significant. [Desai, Jain 1997] infer in line with the argumentation of [Ikenberry et al. 1996] that investors appear to under react to the information conveyed by the stock split announcement what is consistent with under reaction explanation for the stock-split phenomenon. The positive stock drift in the stock-split-announcement month is indicative of the fact that the information of the announcement is not fully incorporated in the stock price.

[Ikenberry, Ramnath 2002] provide further evidence on the effect of stock splits on subsequent stock price performance. They report a 9-percent positive stock price drift for 3,028-stock-split events from the time span of 1988 and 1997 in the first year following the announcement of the stock-split event. Furthermore, the analysis is extended to as early as the 1930s and the conclusions remain unaffected. In sum,

[Ikenberry, Ramnath 2002] do not only indicate that the post-split anomalous behavior of the stock price from the perspective of the assumption of market efficiency is not spurious but it also supports the market underreaction to firm-specific events.

On the contrary, [Byun, Rozeff 2003] provide evidence which supports the market efficiency hypothesis. The authors review the stock split phenomenon using the sample composed of 12,747 stock-split events performed between 1926 and 1996. The research study provides an interesting point to the discussion about the influence of stock splits on subsequent abnormal stock price performance, that is, the authors contend that when the whole record is considered the stock splits imply no abnormal returns, neither positive nor negative. Further, based on the sample of two-for-one stock splits from the time period of 1975–1990 the authors document statistically significant value-weighted cumulative abnormal returns of 3.06%. At the same time, [Byun, Rozeff 2003] do not question the findings indicating abnormal rates of return around the announcement or execution date. In sum, the null hypothesis of a zero abnormal rate of return around the split event cannot be rejected.

The literature abounds with evidence on some regularities or more generally some anomalous behavior accompanying the stock splits also with respect to capital markets outside the U.S. [Wulff 2002] analyzes German capital market assembling a sample comprised of 83 stock-split events covering the period of 1994-1996. The author finds no announcement-day abnormal returns but on the first trading session following the announcement date there is observed a 1-percent significant excess return at the level of .47%. Moreover, the splitting stocks experience statistically significant excess returns in the event window $[+1;+4]$ where $t=0$ denotes the announcement day. The evidence on abnormal returns around the execution date is not as pronounced as for the prior evidence on the U.S. capital market, and so they equal 5%. The author has also utilized another event window $- [-2;+3]$ for which the excess returns are lower than 1.16%. The analysis of the impact of stock splits on price performance extends to as early as 1965 and yields similar results. The chief conclusion of the paper is that the announcement effect reported in case of the German capital market supports the neglected firm hypothesis.

In turn, [Leung et al. 2005] examine the post-split long-run performance on the example of companies listed on the Hong Kong Stock Exchange. The sample spanning the period of 1998–2000 is researched by means of the market model. The splitting stocks have experienced a pre-split run-up. The authors find a positive stock price reaction and attribute it to the favorable signal that is conveyed to the market through the medium of stock splits. One may observe statistically significant 5.19-percent cumulative abnormal returns in the $[-1;+1]$ event window around the announcement date. The results are consistent with the signaling hypothesis. Moreover, there is found no significant evidence on long-run performance in the event window $[-60;+360]$.

The article is aimed to investigate whether stock splits performed between 2009 and May 2011 inclusive by companies listed on the NYSE implied any abnormal returns.

3. Sample and method

The sample is comprised of firms listed on the NYSE that split their shares between 2009 and May 2011 inclusive. It contains 54 stock-split events. There have been used two methods to examine the effect of splitting the shares on subsequent abnormal returns, i.e. Mean Adjusted Return Method and Market Model Method. The author reviews three time intervals, and so the ex date for individual stocks, ex date for entire sample and the $[-40;+40]$ event window including the execution date. The split events and respective execution dates of the splitting firms were collected from the Financial Calendars of Stock Splits provided by Yahoo! Finance.

3.1. Mean Adjusted Return Method

The abnormal rate of return is the difference between the actual rate of return and the mean rate of return from the period preceding the event window, i.e. $[-240;-41]$ and is given by the formula

$$r_{it} = R_{it} - \hat{R}_{it}$$

where: R_{it} – rate of return on i stock on t day;

and:

$$\hat{R}_{it} = \frac{1}{200} \sum_{t=-240}^{-41} R_{it},$$

where: R_{it} – rate of return on i stock on t day

The *ex ante* rate of return that is expected to be achieved on a given security does not vary with respect to time. On the other hand, it can differ when considering various stocks.

3.2. Market Model Method

The abnormal rate of return is given by the formula:

$$r_{it} = R_{it} - \hat{\alpha}_j - \hat{\beta}_j R_{mt}$$

where: R_{it} – rate of return on i stock on t day; R_{mt} – the return on a market index on day t ; $\hat{\alpha}_j$ – intercept estimated during the regression analysis; $\hat{\beta}_j$ – slope coefficient estimated during the regression analysis; ε_{it} – statistical error for which the following holds $\sum \varepsilon_{it} = 0$.

The advantage of this method results inter alia from the fact it includes the risk accompanying the market. For the purposes of this method one regresses the daily rates of return on a given security on analogous returns on a broad market that is proxied by the index S&P500.

3.3. Statistical Significance of Returns

The null hypothesis states that the 1-day residual for a given splitting stock is equal to 0; the t statistic assuming that the returns for that stock are independently and identically normally distributed is as follows:

$$\frac{r_{jt}}{\hat{S}(r_j)}$$

and can be described by t -distribution where:

r_{jt} – the residual for i company at the moment t ; $\hat{S}(r_j)$ – the standard deviation of residuals for i company; it is given by the formula:

$$\sqrt{\frac{1}{199} \sum_{t=-240}^{-41} (r_{jt} - \bar{r}_j)^2}$$

with 199 degrees of freedom.

For more than 30 degrees of freedom the t -statistic has a standard normal distribution. One can reject the null hypothesis if $\frac{r_{jt}}{\hat{S}(r_j)}$ exceeds the critical value at a particular significance level. The 1-day abnormal return for the whole research sample is given by the following formula:

$$AR_t = \frac{1}{N} \sum_{j=1}^N r_{jt}$$

and consecutively t -statistic is obtained from the following formula:

$$t = \frac{AR_t}{\hat{S}(AR)} = \frac{\frac{1}{N} \sum_{j=1}^N r_{jt}}{\sqrt{\frac{1}{199} \sum_{t=-240}^{-41} (AR_t - \overline{AR})^2}}$$

where: $\hat{S}(AR) = \sqrt{\frac{1}{199} \sum_{t=-240}^{-41} (AR_t - \overline{AR})^2}$ is the standard deviation of the whole sample and:

$$\overline{AR} = \frac{1}{200} \sum_{t=-240}^{-41} (AR_t).$$

The test statistic for the event window is given by the formula:

$$\frac{CAR}{\hat{S}(AR)} = \frac{\sum_{t=-40}^{+40} AR_t}{\hat{S}(AR)}$$

where:

$$\hat{S}(AR) = \sqrt{\frac{1}{80} \sum_{t=-40}^{+40} (AR_t - \overline{AR})^2}$$

4. Results and conclusions

The abnormal rates of return for the whole sample do not significantly differ from zero whereas in case of individual splitting stocks there have been found three issues which are statistically significant. Interestingly, for two of them, i.e. for Enbridge (ticker: ENB) and Edwards (ticker: EW) one may observe one-day negative abnormal rates of return at the level of -2.90% for both stocks and significant at 1% and 5%, respectively. In case of Lear (ticker: LEA) there has been reported a 5-percent significant abnormal rate of return equal to 3.61%. The results point out that the market has incorporated the information of the stock split earlier starting from the announcement date, or, equivalently, that the actual split date does not convey any new information to the market, at least on the example of the sample under review.

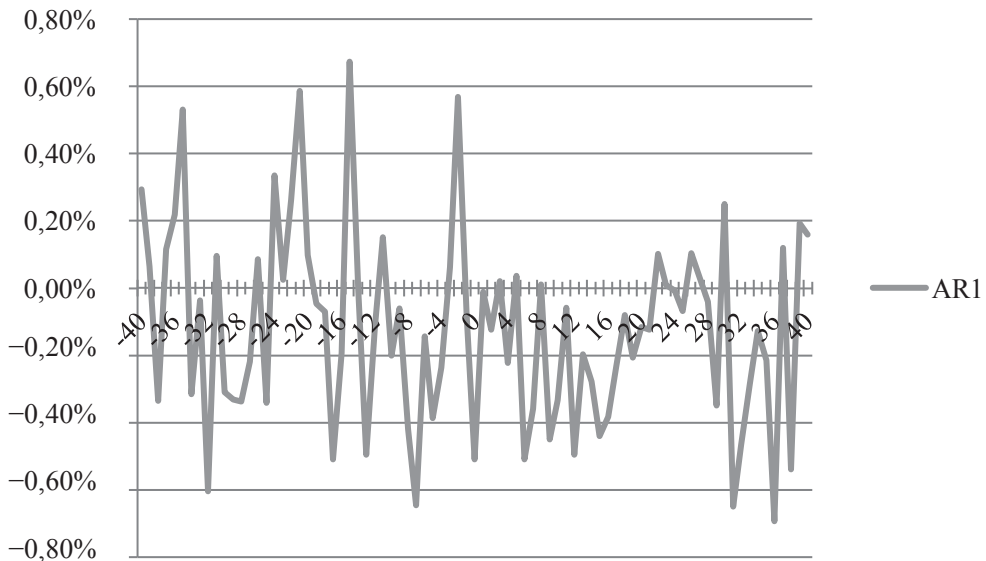


Figure 1. Abnormal Rates of Return for Mean Adjusted Return Method

Source: own study.

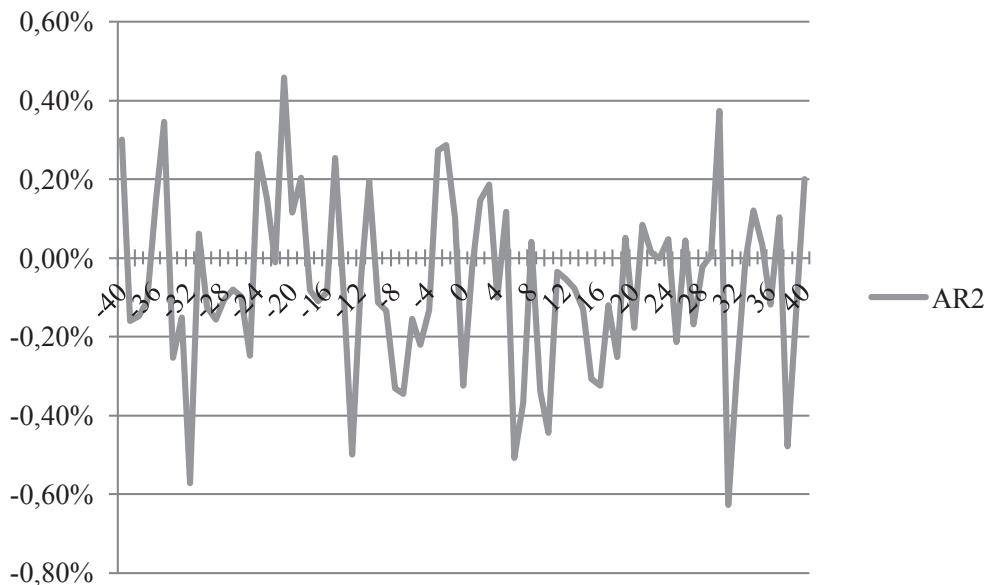


Figure 2. Abnormal Rates of Return for Market Model Method

Source: own study.

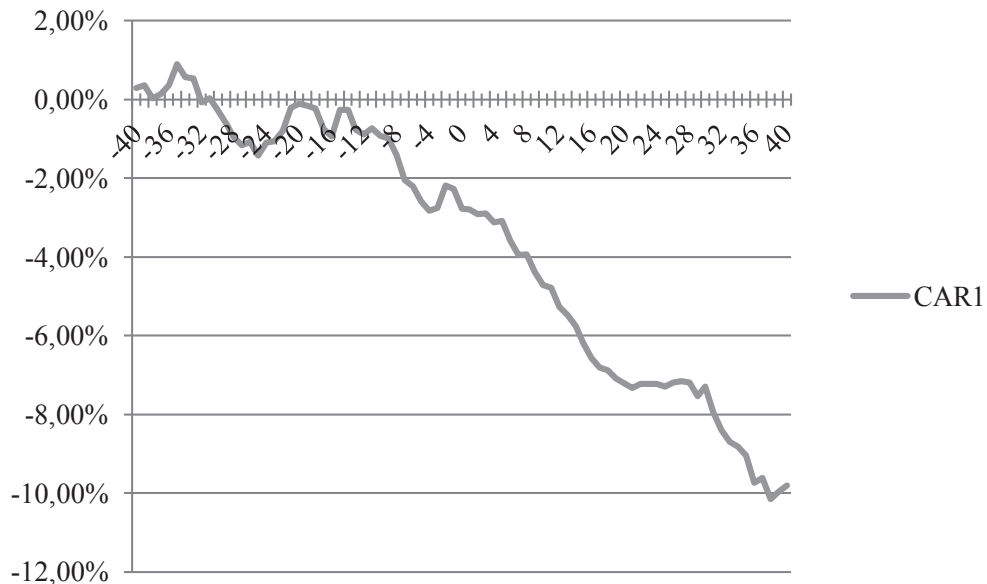


Figure 3. Cumulative Abnormal Rates of Return for Mean Adjusted Return Method

Source: own study.

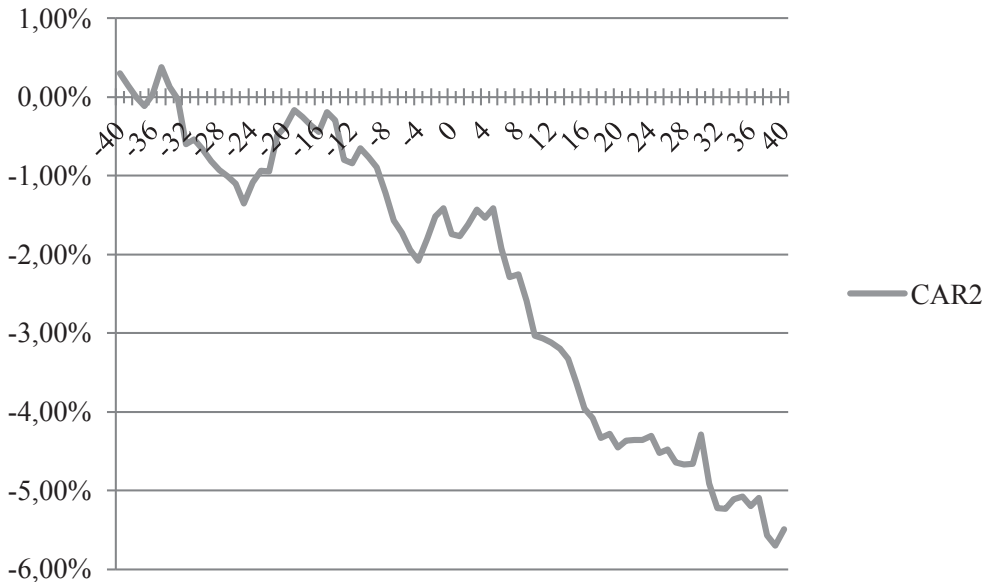


Figure 4. Cumulative Abnormal Rates of Return for Market Model Method

Source: own study.

Abnormal rates of return for both methods employed with some exceptions fluctuate between two bounds, i.e. the -6% and 6% . Interestingly, as opposed to some research studies led by [Ohlson, Penman 1985], the results obtained indicate that the volatility as measured with standard deviation of abnormal returns does not increase. By contrast, it declines by 26.98% and 6.04% for mean adjusted return method and market model method, respectively. One may interpret the slippage of the variance as an argument that supports the rationale of splitting the shares or, by the same token, that can be regarded as one of the management motivations to split the stock. In fact, the diminution of stock price volatility contributes to a lower cost of equity.

Basing on the visual inspection of Figures 3 through 4 one can infer that the stock splits depress the subsequent stock performance. In particular, the cumulative abnormal rates of return within the event window considered amount to -9.8% and -5.49% for both methods, respectively. Additionally, the cumulative abnormal rates of return are strikingly similar with respect to the shape in the period following the ex date, and so after some rebound around the actual split day they experience an apparent and steep decline with slightly different magnitude when considered both cases. One of the interpretations of the results obtained can be the deterioration of shareholders' wealth. On the other hand, during the time period analyzed there occurred one of the biggest rebounds in the U.S. stock market after the global financial crisis that roiled from 2007 to 2009 what does not lend itself to the interpretation rested on the overall capital market situation. Moreover, the stock prices of numero-

us companies listed on the NYSE were severely hurt by the aforementioned global financial crisis what to some extent can be indicative of that the stock-split events were not preceded with a price run-up.

One of plausible explanations of the negative cumulative rates of return can be the neglected firm hypothesis, i.e. the splitting firms perform a stock split to attract more attention from analysts, media and the market as a whole. But the attempts of managers to capture the interest fail or the negative price drift following the ex date occurs simply because the splitting companies do not exhibit good investment opportunities. To better examine this possible explanation one must also analyze the stock price behavior around the announcement date or subsequent performance of splitting companies measured with e.g. the realized earnings or cash flows achieved in the quarters following stock split event what is the subject to a further study.

Nonetheless, one could ask a question about the assumption of market efficiency. The ex date is well known in advance, and so it does not constitute any new information. In spite of this fact, the cumulative abnormal returns decline in the wake of the stock split and the pace of the decrease expedites following the split. On the other hand, one must be cognizant of the fact that the results may be sensitive to the time period considered. In sum, the stock splits are not always a value enhancing tool and sometimes they can even erode shareholders' wealth. The stock-split phenomenon although more clarified by this paper has not been resolved yet and deserves further analysis.

In summary, stock splits are not neutral to stock's characteristics as assumed by the market efficiency hypothesis that predicts that the sole implication of split should be increased number of shares outstanding with no change in the proportional stakes of particular shareholders. More specifically, for the New York Stock Exchange that to some extent can be regarded as a developed capital market stock splitting firms experience a negative consequence after the event which manifests itself in shareholders' wealth deterioration. On the other hand, there is observed another property, in particular the volatility of abnormal returns slides following the split what constitutes positive information for managers that might expect a positive adjustment of the cost of equity due to lower market risk of the stock.

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CZY PODZIAŁ AKCJI MOŻE BYĆ ŹRÓDŁEM PONADPRZECIĘTNYCH STÓP ZWROTU W CZASACH PO KRYZYSIE 2007-2009? PRZYKŁAD NOWOJORSKIEJ GIEŁDY PAPIERÓW WARTOŚCIOWYCH

Streszczenie: Podział akcji, a w konsekwencji ceny walorów i płynności od dłuższego czasu skupiają uwagę badaczy i praktyków. Autor analizuje podziały akcji przeprowadzone w okresie 2009 – maj 2011 przez spółki notowane na Nowojorskiej Giełdzie Papierów Wartościowych. W szczególności rozważa on wpływ podziału akcji na bogactwo akcjonariuszy, biorąc pod uwagę dzień dokonania splitu oraz przedział badawczy $[-40; +40]$, wykorzystując dwie metody: metodę średniej dopasowanej stopy zwrotu oraz metodę modelu rynkowego. Uzyskane wyniki wskazują, że nie występuje istotny statystycznie efekt w dniu samego podziału. Natomiast w rozważanym oknie badawczym autor obserwuje erozję bogactwa akcjonariuszy mierzonego skumulowaną ponadprzeciętną stopą zwrotu na poziomie $-9,80\%$ oraz $5,49\%$ dla zastosowanych obu metod. Ponadto zmienność mierzona odchyleniem standardowym ponadprzeciętnych stóp zwrotu uległa zmniejszeniu odpowiednio o $26,98\%$ i $6,04\%$.

Słowa kluczowe: podział akcji, ponadprzeciętna stopa zwrotu, bogactwo akcjonariuszy.