ANNOUNCEMENT OF THE EXCHANGE RATIO OF THE MERGING COMPANIES - IMPACT ON THE ACQUIRING FIRMS

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Abstract

In merger transactions the value of the share exchange ratio is essential, because it affects the distribution of the benefits of the merger. The aim of this study is to analyze the impact of announcements of the agreed by boards share exchange ratios on the valuation of shares of companies involved in the merger as acquiring companies. The method used for measuring the impact of exchange ratio announcement on the share prices is the event study, in which the abnormal rates of return were counted, showing the extent to which the actual rates of return on shares of the merging companies are different from the expected rates of return that would occur if there was no any extraordinary event, such as announcement of the merger plan. Previous studies indicate that the acquiring companies on average did not gain in mergers.

1. INTRODUCTION

Companies, or, to be more precise - their owners or their managers, tend to combine with other firms. Benefits of such transaction for the merging parties depend to a large extent on the exchange ratio. It affects how much of the newly merged company (the sum of the two previously existing entities) will be in the possession of the shareholders of both companies. Regardless of whether the whole transaction is successful or not (the successful transaction is to raise the value of the companies), the share exchange ratio affects the distribution of benefits resulting from the merger. The aim of this paper is to analyze the impact of the share exchange ratio announcement on the valuation of shares of companies involved in the merger. Research hypothesis states that investors feel anxiety regarding the announcement of the share exchange ratio, manifested by a fall in share prices with respect to the situation if such an event did not occur. The applied method of measuring the impact of the share exchange ratio announcement on the share prices is event study and cumulative abnormal returns (CAR).

2. MERGERS OF COMPANIES - THE SHARE EXCHANGE RATIO AND ITS EFFECT ON THE MERGER BENEFITS

In accordance with paragraph 1 of Article 492 Polish Commercial Companies Code, "the connection can be made:

1) by transferring all the assets of the company (the target) to another company (the acquirer) for the shares that the acquiring company issued to the shareholders of target company (merger by acquisition);

2) by setting up a new company, where all the assets of the merging companies in exchange for the shares of the new company are put in (merger by the formation of a new company)."

Regardless of which of these methods of combination is chosen, for a given transaction to occur it is necessary to determine the exchange ratio of shares of the company being acquired or merging companies by the formation of a new company for shares of the acquiring company or the newly established company [Polish Commercial Companies Code, 2000, art. 499, par. 1. pt. 2].

The issue of setting the correct exchange ratio of shares, which appears in the decision-making process related to the merger of companies, is extremely important. Exchange ratio indicates the share of current shareholders of the two merging companies in the new entity (which is formally one of the existing companies). Thus, the agreed share exchange ratio influences whether the currently held assets and the related prospects for its expansion remain at the same level, or unexpectedly decrease or increase [Weston, 1966, 117-38].

Therefore, the problem of determining the proper share exchange ratio is a subject for scientific research and related publications. One of the models based on a Price-Earnings ratio, indicating the optimal boundaries of the share exchange ratio, is the model of Larson and Gonedes [Larson, 1969, 720-8]. This model was empirically verified by Conn and Nielsen for transactions that took place in the U.S. during 1960-1969 [Conn, 1977, 749-59], yielding ambiguous results, followed by Cooke, Gregory and Pearson for transactions that took place in UK in the years 1984-1988 [Cooke, 1994, 133-147], where the results were better, especially for the version with the introduced amendments, and the model was considered helpful in determining the minimum and maximum limits for the share exchange ratio for negotiations before the merger. Another attempt to develop a model and test it on data from the U.S. was carried out by Conn, Lahey and Lahey, where the findings of the analysis was the conclusion that the development of the model of Larson and Gonedes will improve its ability to forecast [Conn, 1991, 35-45].

Another model related to the problem of selection of the share exchange ratio is the model of Yagil, which is based on dividend growth rates [Yagil, 1987, 195-202]. Bae and Sakthivel test both models: the Larson-Gonedes' and the Yagil's one, using data from the U.S. in the years from 1981 to 1994 [Bae, 2000, 511-521]. The analysis found that the model of Larson and Gonedes has better prediction properties, which gave about half correct results, while the model of Yagil far less [Bae, 2000, 520].

As concluded above, the determination of the proper share exchange ratio has a very significant impact on the value of the shareholders of the merging companies' assets. Therefore, the publication of information about the exchange ratio of shares may cause share price reaction of the merging companies. The tool which is used to evaluate the impact of certain events relating to the company on its share price is the event study. The event study method examines the impact of certain events on the rates of return on shares, which would not

change if the event did not exist. This method is used to assess the impact of disclosure of earnings forecasts, the publication of financial statements or changes in dividend policy on share prices of companies. It is also often used for assessing the impact of mergers and acquisitions on return rates [Mandelker, 1974], [Langetieg, 1978] [Dodd, 1980], [Jensen, 1983] [Jarrell, 1989] [Roller, 2001], [Goergen, 2003] [Piecek, 2004], [Perepeczo, 2006], [Czerwonka, 2009] and others. Among these publications can be noted the Jensen and Ruback's article [1983], in which the authors analyze a dozen previous research programs of assessing the influence of mergers on the firm's value. Jensen and Ruback state that shareholders of the target companies always gain in such transactions, while the extraordinary profit for shareholders of acquiring company is very small, or even the owners of the acquiring companies lose on the takeover transaction in the period around the time of the announcement of a bid.

The above conclusions are consistent with those obtained in this study, which analyzes the impact of mergers on the price of companies that have agreed to be the acquiring party during merger transaction. In the analysis the event day is the date of publication of the share exchange ratio (usually in the merger plan, although sometimes in the market filing on intention to merge).

3. ANALYSIS DESCRIPTION

The analyses in this study are based on the cumulative abnormal rate of return CAR, which is calculated as the sum of abnormal returns in a certain period, or, in other words, CAR is the sum of rates of return that change because of the occurrence of the event. The abnormal rates of return for individual periods are calculated as the difference between the actual rates of return and expected rates of return, counted according to the rules of an assumed model [Kothari, 2006; Czerwonka 2010]. The models used in event studies are [Perepeczo, 2006, 428-429; MacKinlay, 1997, 17-19]:
- mean-adjusted return model - which assumes that the expected rate of return is equal to the average rate of return on the company shares in the period before the event,
- market-adjusted return model - which assumes that the expected rate of return on the share is equal to the rate of return on the market index during the event window,
- market model – which assumes that the rate of return on the shares is associated with the stock exchange,
- capital asset pricing model (CAPM) - which assumes that the rate of return on the shares is associated with the stock exchange, taking into account the risk-free interest rate,
- Fama and French three factor model – which takes into account not only the market index and the risk-free interest rate but also the returns on portfolios with respect to book-to-market ratio and the size factor,
- reference portfolio model - which assumes that the expected rate of return on company shares is equal to the rate of return on the portfolio of firms which are similar with respect to size, industry or book-to-market ratio,
- matching with control firms model – which assumes that the expected rate of return on company shares is equal to the rate of return on similar firm.

Previous studies indicate that the most popular of the models is the Market Model. It assumes that the return on *i* shares in period *t* is connected with changes in the market. The formula for the abnormal return is obtained by the model estimation with the ordinary least squares method (OLS):

$$AR_{it} = R_{it} - (a_i + b_i R_{mt}) \text{ , where:}$$

AR_{it} – abnormal return on i share in period t,
R_{it} – return for the share of firm i on day t,
R_{mt} – return for the market portfolio on day t,
a, b – parameter estimates obtained from the regression of R_{it} and R_{mt} over period preceding the event [McWilliams, 1997, 628].

After summing abnormal returns for appropriate number of days the cumulative abnormal return for individual firm is obtained:

$$CAR_{iT} = \sum_{t=1}^{T} AR_{it} \text{ ,}$$

where:
CAR_{iT} – cumulative abnormal return on i share obtained in the event window T,
T – the event window [Perepeczo, 2006, 424].
Counting the average value of CAR for the whole sample gives the indicator which shows if the event has positive or negative impact on the share prices.

The study was conducted using analysis of cumulative abnormal returns (CAR) based on share prices obtained from WSEInfoSpace service, which is an information service on companies listed on the Warsaw Stock Exchange, developed in cooperation between the Warsaw Stock Exchange (GPW) and the Polish Press Agency (PAP). The estimation window, which is the period from which come the data allowing estimation of model parameters, this period is 150 days long, from -210 to -60 trading days with respect to day of the announcement of the share exchange ratio. The model used in the analysis, which allows the determination of the theoretical values of the share prices, is the market model (also known as the Sharpe's model)

The research sample included companies listed on the Warsaw Stock Exchange, which in years 2005-2007 announced signing the merger plan with another company and took on themselves the role of the acquiring company. Such companies, which also meet the conditions set out below were in the number of 16. Those companies have been found in the market filing search engine of Money.pl service, and the content of the communications has been verified on the basis of current reports from the archive site of WSEInfoSpace. From the sample were excluded transactions of firms with their subsidiaries, which took place without increasing the share capital of the acquiring company, and without issuing shares by the acquiring company in exchange for shares of the target company.

4. THE SHARE EXCHANGE RATIO ANNOUNCEMENT AND ABNORMAL RETURNS

Announcement of the share exchange ratio is an event of great importance to investors. The exchange ratio is usually published in the merger plans, which include the share exchange ratio of the merging companies and its justification. However, sometimes the exchange ratio is included in market filings concerning intention to merge. Taking into account that the merger plan is developed and agreed by the boards of the merging companies, which are generally supported by major shareholders, it is very likely that this plan will be accepted and the exchange of shares will take place at the proposed ratio. Thus, the published exchange ratio very often (or even almost always) indicates the ultimate way of exchanging shares of both companies, in order to obtain the proper share in the combined

assets after the merger. Therefore, this moment has very significant impact on the future prosperity of investors.

Analysis of the cumulative abnormal rates of return for information about the announcement of the share exchange ratio, carried out near the date of publication of the ratio, revealed on average the negative effect of the information on the valuation of companies. In the event window for days -5 to +5, with respect to the date of publication of the share exchange ratio (intention to merge or plan of merger), the cumulative abnormal return was equal to -3.87 percent (Table no. 1). It means that the average rate of return of companies that have published the share exchange ratio was lower by 3.87 percent, in relation to the situation if they had not published this indicator. For the event window from -2 to +2 days cumulative abnormal rate of return was -2.98 percent, similarly as for the period from -1 to +1 day. This indicates that, on average, investors in the period of publication of the merger plan were concerned about the impact of merger on their assets.

Table no. 1 Cumulative Abnormal Returns (CAR) for companies listed on the Warsaw Stock Exchange which published the exchange ratio in years 2005-2007

Event window	CAR (%)
(-/+5)	-3.87
(-/+2)	-2.98
(-/+1)	-2.98

Source:[own compilation.]

The average value of the cumulative abnormal return for the period covering the date of publication of the share exchange ratio and days directly preceding and following the day of publication (CAR -/+ 1) is negative. Analysing the number of positive and negative results (divided into deciles - Table 2), it can be noticed that about two-thirds of cumulative abnormal returns for individual companies was negative, so the companies that lost their value accounted for the majority.

Table no. 2 Cumulative Abnormal Returns CAR -/+1 divided into deciles

Deciles	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90
CAR (%)	-7.18	-4.90	-2.73	-2.25	-0.80	-0.38	1.23	2.82	5.45

Source: [own compilation.]

The analysis presented above applies to several-day event windows around the date of the announcement of the exchange ratio. Further analysis shows the behaviour of abnormal returns for each day of the period. Table 3 shows the abnormal rate of return for the day of revealing the share exchange ratio, the day before and the day after the announcement of the merger plan (or intention-to-merge market filing). The table also includes p-value of t-test, indicating whether the calculated average shows a statistically significant difference to the reference value, which in this case is zero. The p-values, which indicate statistical significance, should be assessed with caution since the variables do not meet the condition of normal distribution. Nevertheless, it is worth observing where p-values indicate the possibility of failing to reject the null hypothesis and where they indicate the need to reject the null hypothesis.

Table no. 3 Abnormal Returns AR for days (-/+1) for publication of the exchange ratios by companies listed on the Warsaw Stock Exchange in years 2005-2007

day	AR (%)	p
-2	-0,6588	0,352
-1	0,1233	0,794
0	-0,0840	0,972
1	-3,0173	0,017
2	0,6602	0,546

Source: [own compilation.]

It can be noted that before the announcement of the share exchange ratio the average abnormal rate of return is positive, while on the day of announcement of the ratio the rate of return is negative. However, as it can be seen in the column "p-value" in both these days has to be very large scattering of individual results, so that statistically these results can not be considered different from zero, neither at the usual significance level of 0.05, nor even at the significance level 0.1.

It can be noticed that one day after the announcement of the exchange ratio, when the information has already reached all investors, there was a statistically significant response amounting to -3 percent. Thus, the information has caused concern among investors about the impact of the announced share exchange ratio and the merger itself on their assets.

As noted above, the statistical significance of results, for the days when the share exchange ratio was known, was influenced by the distribution of abnormal returns for individual companies. The distribution of abnormal returns for the days "0" and "+1" was shown in Figure no. 1.
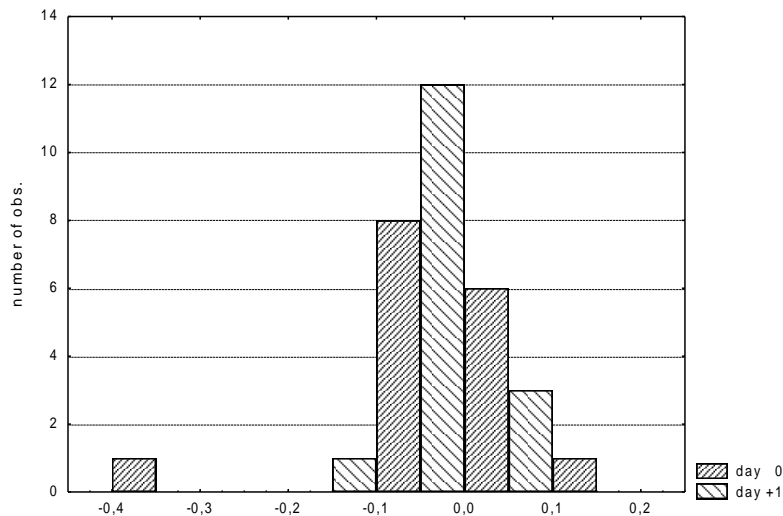
Source: [own compilation]

Figure no. 1 The distribution of Cumulative Abnormal Returns in the event window (0, +1) for the publication of the share exchange ratio in years 2005-2007 by the companies listed on the Warsaw Stock Exchange

It can be noticed on the Figure 1 that while on the day of the exchange ratio announcement the distribution of abnormal returns was more symmetric, on the next day, when the information about the exchange ratio has already reached all investors, the distribution is clearly left-skewed - 81 percent of companies in the sample obtained negative result on that day. This result clearly indicates that investors are concerned as to the existence of their investments.

5. CONCLUSIONS

There is no doubt that the share exchange ratio has great impact on the benefits which shareholders can gain from a merger of their companies. Therefore, there can be fluctuations in share prices when the exchange ratio is announced. The direction of those fluctuations depends on the shareholders recognizing the value of exchange ratio agreed by boards as gainful for them or not. The analysis of a sample of companies, which in 2005-2007 took part in the merger transactions as the acquiring parties, indicate that on average shareholders consider information about the value of share exchange ratio as harmful for them. The cumulative abnormal rates of return for event windows from several days prior to several days after the date of announcement of share exchange ratio are negative, which means that those companies in the analyzed period had lower returns in comparison to the situation when the event had not occurred. Moreover, the analysis carried out for single-day event windows, including the day of announcement of the exchange ratio, indicates that the next day after announcing the value of the ratio, the day when all investors can gain the information, there is a negative reaction of abnormal returns, amounting on average to -3 percent, and this result is statistically significantly different from zero. Investors who are shareholders of acquiring companies are usually very disappointed with the values of exchange ratio suggested by the boards of companies. The problem of proper value of the exchange ratio and models which describe it will be the object of further research.

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