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Short-term Price Reaction to Involuntary Bankruptcies Filed in Bad Faith: Empirical Evidence from Poland

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Abstract:

Purpose: *Assessing the reaction of the prices of shares of companies listed in the Warsaw Stock Exchange to the public disclosure of information about the filing a bankruptcy petition in bad faith by creditors.*
Design/Methodology/Approach: *Event study analysis.*
Findings: *It can therefore be assumed that the filing of an unfounded bankruptcy petition does not, in the short term, have a statistically significant negative impact on the share price of the company being the subject of the petition*
Practical Implications: *When information about the filing a bankruptcy, petition appears and creditors submitted it in bad faith, it has not a negative impact on the share price in short term. It can be said that submitting such information is not an opportunity for an investor to receive an abnormal rate of return.*
Originality/value: *Although there are many research results using event study analysis most of them are related to the US market. The originality of this paper is that this research is dedicated to petitions in bad faith for a selected developing country.*

Keywords: *Bankruptcy petition in bad faith, event study, share price, efficient market hypothesis.*

JEL classification: *G11, G14, G32, G33, G41.*

Paper Type: *Research study.*

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1. Introduction

One of the breakthroughs in financial theory was the development of the efficient market hypothesis and the concept of adjusting prices to emerging information. Its origins should be sought in the random walk theory proposed by Bachelier (1900), while the formal assumptions were presented in the 1960s by Samuelson (Delcey, 2019) and Fama (1965a; 1965b; 1970), who was awarded the Nobel Prize in 2013. Over time, this theory has been criticised many times, and more and more researchers have presented results that undermine it. To this day there are disputes between researchers about the validity of this hypothesis. For example, a conversation between Fama and Thaler (2016) on the verifiability of the hypothesis of market efficiency in practice went down in history. There have been many studies on deviations from the mainstream theories. One of the key areas of growing interest is behavioural finance, which examines, among others, all kinds of anomalies in the capital market, constituting the foundations of numerous investment strategies.

Also, psychology has become increasingly important in the study of investment behaviour. The precursors of this type of research include Dreman (1982), Howe (1986), De Bondt (2000) and Thaler (2016), who deal with the theory of price overreaction and underreaction to news. It shows that prices react too intensively (overreaction) or only slightly (underreaction) to certain information (De Bondt and Thaler, 1985), which is due to psychological factors (Dreman and Lufkin, 2000). The effect of the reaction of share prices and the level of their volatility to emerging information was often examined using the method of event analysis both in the short and in the long term (Kothari and Warner, 2007). The assessment was made of the impact of both positive or negative announcements and untrue information, including: fake news (Clarke *et al.*, 2019), publication of stock market recommendations (Liu *et al.*, 1990), information on mergers (Rosen, 2006; Keown and Pinkerton, 1981), earnings (De Bondt, 2000), stock splits (Gulen and Hwang, 2012), dividends (Michaely *et al.*, 1995), corporate strategy, customers and partners, products and services, management changes, legal developments (Neuhierl *et al.*, 2013), unexpected deaths of senior corporate executives (Johnson *et al.*, 1985), corporate governance news (Brogi and Lagasio, 2018) or news about the R&D process (Perez-Rodriguez and Valcarcel, 2012).

In addition to the above, the reaction of share prices to information on the functioning of companies at risk of bankruptcy or filing petitions for bankruptcy or rehabilitation proceedings was also analysed. Bonnier and Bruner (1989) achieved results which show that the communication of information about the change of management in distressed companies generates short-term positive price changes. Clark and Weinstein (1983) and Schatzberg and Reiber (1992) noted the short-term stock price reversal after the notification of the submission of the petition for rehabilitation proceedings under US Chapter 11, i.e., after significant price decreases during the petition submission period, an abnormal return rate was observed. A similar effect was achieved by Datta and Iskander-Datta (1995) and Dawkins *et al.*

(2007). Apart from the psychological factors described in the price overreaction and underreaction theory, the fact that insiders sell stock before prices fall and buy stock after prices have fallen may also explain this effect (Seyhun and Bradley 1997).

However, confirming this effect would require in-depth research. Coelho and Taffler (2009a) were studying the long-term effect of applying for Chapter 11 procedure. It turned out that after 12 months the average abnormal return rate was 28%. The authors also verified how the rates of return behave because of the provision of information on the initiation of rehabilitation proceedings under Chapter 11 for strategic and non-strategic reasons. No significant differences were found between the period of filing the petition and the preceding one.

On the other hand, companies filing petitions for strategic reasons achieved much higher rates of return within a few months after filing such a petition (Coelho, Taffler, 2009b). Rose-Green and Dawkins (2000) proved that, at the time of the submission of the petitions, the prices of the companies in which bankruptcy proceedings were initiated were falling more sharply than those in which the rehabilitation proceedings were commenced. In addition, Chen and Church (1996) concluded that companies which received going concern opinions achieved at the moment of notifying the public of the bankruptcy petition less negative rates of return than companies which did not have such opinions. One of the few studies conducted in a market outside the USA concerned Malaysia. It showed that the notification about the bankruptcy of a company generates a negative abnormal return in the short term. What is more, re-emerged firms experience significantly less negative abnormal returns compared to delisted firms (Ahmad *et al.*, 2016).

Most of the above studies were carried out based on data from the USA and none of them concerned the analysis of the reaction of prices to emerging information on a bankruptcy filing by creditors in bad faith. This is the purpose of this study and, according to the authors' knowledge, it is the first such study that has been conducted so far. In this connection, the following research question is proposed: do share prices react in the short term to emerging information that creditors have filed for bankruptcy in bad faith? The analysis was made based on data obtained from the Polish capital market, which is still perceived by many institutions as an emerging one. Poland is still regarded by many organisations to be an emerging market, although FTSE Russell, for example, reclassified it in 2018 to developed markets. Information on filing a bankruptcy petition in bad faith was obtained from current reports published by the companies in the period 6 December 2004 – 31 December 2019. The event analysis was adopted as the research method.

The article is structured as follows. Apart from the introduction, the second part of the study presents issues concerning the concept, types, effects, and legal regulations of bankruptcy initiated in bad faith, with particular emphasis on the situation in Poland. The third section presents the research methodology, together with a description of the sample selection and the research method used. The next section

contains the results and the final one provides conclusions of the analysis carried out.

2. Bankruptcy Petitions Filed in Bad Faith — Literature Review

In most countries, bankruptcy petitions can be made by debtors or creditors — the former are generally obliged to initiate bankruptcy proceedings if there are certain reasons, such as lack of liquidity or insufficient assets to cover all liabilities (according to the so-called balance sheet test). Petitions submitted in bad faith are characterized by the fact that the prerequisites for bankruptcy or rehabilitation proceedings are not met, and most often the applicant aims to achieve benefits at the expense of another group of stakeholders. The literature on the subject does not devote much attention to this issue, and most of the legal publications on these problems refer to the United States (Ponoroff, Knippenberg, 1991; Ponoroff, 1992; Godshall and Gilhuly, 1998). Petitions of this kind may be filed by both debtors and creditors.

In the USA, numerous petitions were filed by solvent organisations that generated positive cash flows. Bankruptcy or rehabilitation proceedings were conducted in order to address specific problems, e.g. to limit the impact of potential penalties (asbestos companies; archdioceses in which priests committed sexual abuse); to reduce labour costs (steel producers who promised their employees high retirement severances in exchange for lower wages; Continental Airlines Corporation, the main motive of which was to terminate the collective agreement) (Skeel Jr., 2003; Ponoroff and Knippenberg, 1991). In theory, some of such cases are often referred to as "strategic insolvencies" (Delaney, 1998). In this article the second type of petitions, i.e., involuntary bankruptcies filed in bad faith, are examined.

In the United States, the analysis of these petitions from a legal point of view was carried out by, among others, Shachmurove (2018) and Webster (2019), while in Poland the subject was dealt with by Piłat and Miłaszewski (2019). Such petitions are filed by creditors, either for their intended benefit or, less frequently, for the benefit of other stakeholders. The main reason for such petitions in the case of creditors is to persuade the debtor to settle its obligations towards them. The costs of initiating bankruptcy proceedings are much lower than the expenses necessary to initiate civil proceedings and then carry out the bailiff's enforcement.

In addition, these petitions are also filed when there is a disputed claim, and the creditor wants to put pressure on the debtor to settle it. Another reason may be a reduction in the debtor's competitiveness in relation to companies operating in the same industry that benefit from this situation. In extreme cases, such action aims at lowering the market prices of listed companies to acquire them. Finally, it happens that creditors only want to harm the debtor for personal reasons. The effects of such an action may be varied. The mere filing of a petition for bankruptcy and the publication of such information puts the debtor in an unfavourable light, causing a

deterioration of its image and market position, as well as a drop in share prices. Crediting banks often use clauses entitling them to terminate the loan agreement in such a situation, withdraw from further financing and demand immediate loan repayment. It becomes practically impossible or difficult to raise capital on the market. Suppliers withdraw or demand cash payments, and the best employees are looking for new jobs. In some entities, the probability of inspecting the debtor company by the supervisory authorities also increases (Piłat and Miłaszewski, 2019).

With a view to protecting debtors against this type of action, many legislations have introduced provisions on sanctions against creditors that file for bankruptcy in bad faith. For example, in Poland, Article 34 of the Bankruptcy Law (2003) states: "if a creditor submits a petition in bad faith, the court, rejecting the petition for bankruptcy, shall charge the creditor with the costs of the proceedings and may order the creditor to make a public statement of the relevant content and form. If the creditor's petition for bankruptcy filed in bad faith is rejected, the debtor, as well as a third party, shall be entitled to a claim for damages against the creditor". While these provisions are definitely necessary, it should be borne in mind that damage often occurs immediately after a petition in bad faith is made public, while obtaining general damages can take a long time and require the collection of appropriate evidence.

Creditors acting in bad faith often take these factors into account when analysing potential costs and benefits. It is also essential that the managers of a debtor's company react quickly and inform the public that the bankruptcy petition is not justified considering the financial situation of their entity. What is more, it is important to conduct conversations with key stakeholders and explain to them that there are no grounds for declaring bankruptcy and that the petition was made in bad faith.

3. Methodology

The main research objective is to analyse the reaction of share prices and, at the same time, return rates to the public disclosure of information about the filing of a petition for bankruptcy by creditors in bad faith. Current reports were taken into account, in which the board of directors, at the time of the announcement of filing the petition for the bankruptcy of the company by the creditors also informed the public that, in its opinion, there are no grounds for declaring bankruptcy and the petition is unfounded. The authors assume that if the market is informationally efficient, such a message should not generate above-average negative returns.

The selection of observations for the sample was carried out in the way described below. First, all current reports from the ESPI (Electronic System for Information Transmission) system submitted by companies listed in the Polish stock market in the period 6 December 2004 – 31 December 2019 and available at http://biznes.pap.pl/pl/reports/espi/company/82,2018,0,0,1 were analysed. Out of

367,365 reports, those relating to petitions for bankruptcy filed in bad faith were selected. Observations that revealed relevant disruptive information during the analysis period were removed. For example, Polimex-Mostostal was not considered, as its creditors repeatedly filed petitions which were either later withdrawn by them or dismissed by the court. Finally, 10 companies were selected for the sample. Although it is a relatively small number, this sample considers all the cases observed during the period considered. At the time of submitting the information on filing the bankruptcy petition, the boards of directors of all the companies indicated that it was unfounded. The data related to the test sample and potential disruptive information during the analysis period (0; +5 > session days are shown in Table 1.

Table 1. *The data related to the test sample*

Company	*Date and time of publication of the report on filing a petition for bankruptcy in bad faith (ESPI)*	*The day adopted as the day of the event*	*Relevant information from ESPI in the window of (0;+5> session days after the event occurred*
AWBUD SA / PARTNERBUD	14.07.2015, 17.14	15.07.2015	15.07.2015, 19.02 Revocation of the bankruptcy petition by the creditor. 22.07.2015, 13:15 Conclusion of a significant contract by the issuer's subsidiary.
ERBUD SA	25.02.2013, 23.02	26.02.2013	26.02.2013, 00.09 Submission of the consolidated quarterly report. 28.02.2013, 13.23 and 15.44 Providing information on the signing of significant contracts by the company.
INSTAL KRAKÓW SA	27.02.2015, 13.57	27.02.2015	None
INTERBUD-LUBLIN SA	25.07.2014, 17.44	28.07.2014	None
J.W.	10.07.2009, 14.37	10.07.20	None
KOMPUTRONIK SA	16.09.2011, 13.45	16.09.2011	16.09.2011, 17.22 Board of directors' statement confirming that: - Komputronik SA duly performs all its maturing monetary obligations; - the Issuer is not aware of any circumstances on the basis of which anyone or any legal person would have the right to file a bankruptcy petition. 20.09.2011, 17.29 The court fully agreed with the issuer's argumentation and dismissed the claim of the creditor filing for bankruptcy in its entirety.
MDI ENERGIA SA	26.04.2018, 20.02	27.04.2018	None
MIRBUD SA	9.03.2016, 17.41	10.03.2016	10.03.2016, 07:00, 12:17 Signing a letter of intent to carry out construction

			work. The company's offer was assessed as the most advantageous among the offers for the construction of a school.
MOSTOSTAL ZABRZE	12.07.2007, 16.56	13.07.2007	17.07.2007, 16.56 Dismissal of the petition for bankruptcy by the
NEWAG SA	4.09.2015, 17.23	07.09.2015	8.09.2015, 15.10 The analysis of the petition confirms that the Company has no civil law obligations towards the applicant, as well as that the petition is unfounded and was submitted in bad faith. 09.09.2015, 20:03 Winning the tender for the extension of the Sofia subway.

Source: *Own work based on current reports available at http://biznes.pap.pl/pl/reports/espi/current,2004,0,0,1.*

Additionally, it was assumed that publishing the information at 4.55 p.m. or later meant that the day of the event was the next session day (this meant postponement to the next day, and for Interbud-Lublin SA and Newag SA by three days, as in the case of these companies the information was published on Friday after 4.55 p.m.). The information about the assumed date of the event is also included in Table 1. This assumption results from the fact that investors did not have time to react on the day of publication of the event and their orders were considered already on the next trading day. The date of the event is identical to the date of publication of information for three companies: Instal Kraków SA, J.W. Construction Holding SA and Komputronik SA. In the case of these companies, the information appeared at such a time that investors had at least two hours to react and carry out transactions related to their shares.

The research method adopted in the paper is the analysis of events described in the works of Gurgul (2019) and Sorescu *et al.* (2017). All calculations were made on the basis of daily closing prices, based on which the logarithmic rates of return used in the analysis were calculated. Data on the daily closing prices were obtained from http://infostrefa.com. The event analysis was carried out in the R software environment, using the "EventStudy" package by Schimmer et al. (2015). Abnormal returns (AR) were calculated using a market model in which the explanatory variable was the logarithmic rates of return from the main index of the Warsaw Stock Exchange, WIG. The following model was estimated for each of the ten analysed companies:

$$R_{i,t} = \alpha_i + \beta_i * R_{m,t} + \varepsilon_{i,t} \quad (1)$$

where:
$R_{i,t}$ – the rate of return for company "i" on day "t",
$R_{m,t}$ – the rate of return for the WIG index on day "t",
$\varepsilon_{i,t}$ – the random component,
α_i, β_i – the estimated market-based model parameters.

Hence, the value of the AR rate in the test window was finally determined as:

$$AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i * R_{m,t}) \quad (2)$$

In order to determine the parameters of the above model, it was assumed that the length of the estimation window is 120 observations and that the latest of the observations considered is done seven days before the event. Such a length of the estimation window results, on the one hand, from the fact that the period is long enough to allow for determining the relationship between the company in question and the wider market in a reliable way, while on the other hand, from the fact that the risk-free rate of return, i.e. the α_i parameter, can be assumed to be constant over this period. The test window was set, in turn, as lasting from 2nd day before the event until the 5th day following it.

In addition to AR, the analysis also used the AAR, CAR and CAAR rates. The rates tested were calculated according to the formulas in Schimmer *et al.* (2015).

$$AAR = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t} \quad (3)$$

$$CAR(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{i,t} \quad (4)$$

$$CAAR = \frac{1}{N}\sum_{i=1}^{N} CAR(t_1, t_2) \quad (5)$$

where:
AAR - average abnormal return,
N - number of events in the analysed group (in the conducted study N=10),
CAR - cumulative abnormal return,
t_1 – start of the test window (in the performed analysis: two days before the event),
t_2 – end of the test window (in the conducted analysis: five days after the event),
CAAR – cumulative average abnormal return.

The analysis was conducted in two ways, for each company individually (using the AR and CAR rates) and for the analysed group of ten companies (using the AAR and CAAR rates). The tests used in the analysis, together with an indication of the literature source, are listed in Table 2.

4. Results

The tables below present the results of the conducted analyses. For all the results obtained by means of statistical tests, the same form of marking was adopted. If the significance level of the results obtained was less than or equal to α=0.01, such results are marked as "***". Levels of significance less than or equal to α=0.05 and α=0.1 are marked with "**" and "*", respectively. Table 3 shows the results of the above-average rates of return obtained and the corresponding values of the T-test

statistics, which are written in parentheses. Additionally, if the test result was statistically significant, it was marked as shown above. Importantly, the standard deviation from the estimation window was used to calculate the test statistic.

Table 2. *Statistical tests used in the analysis broken down by the rates of return used*

Rates used	Statistical tests	Source for the test
AR, CAR	1. T-test	1. Gurgul (2019)
AAR, CAAR	1. Patell or Standardized Residual Test (Patell Z) 2. Kolari and Pynnönen adjusted Patell or Standardized Residual Test (Adj. Patell Z) 3. Adjusted Standardized Cross-Section Test (Adj. StdCSect Z) 4. Corrado rank test (Rank Z) 5. Generalized rank Z Test (Gen. rank Z) 6. Generalized rank T Test (Gen. rank T).	1. Patell (1976) 2 and 3. Kolari and Pynnönen (2010) 4. Corrado and Zivney, (1992) 5 and 6. Kolari and Pynnönen (2011).

Note: *The parametric tests are in bold. The abbreviated name of the test is given in brackets — it is used in the further part of the paper.*
Source: *Own work on the basis of https://www.eventstudytools.com.*

Table 3. *T-test results, based on AR rates for companies in the test window (-2,+5)*

Company/ analysis day	**AR(-2)**	**AR(-1)**	**AR(0)**	**AR(1)**	**AR(2)**	**AR(3)**	**AR(4)**	**AR(5)**
AWBUD SA / PARTNERBUD	-2.4% (-0.606)	-0.2% (-0.043)	-2.6% (-0.643)	1.3% (0.334)	-0.2% (-0.06)	-0.6% (-0.156)	2.8% (0.709)	6.8% (1.711) *
ERBUD SA	2.6% (0.939)	-0.3% (-0.096)	6.1% (2.179) **	8.5% (3.018) ***	5.7% (2.032) **	-0.6% (-0.2)	-5.2% (-1.864) *	0.4% (0.146)
INSTAL KRAKÓW SA	4.8% (2.903) ***	1.8% (1.103)	-5.2% (-3.139) ***	1.9% (1.164)	4.5% (2.709) ***	1.8% (1.097)	1.1% (0.685)	-0.6% (-0.358)
INTERBUD-LUBLIN SA	-1.9% (-0.415)	3% (0.643)	-9.9% (-2.118) **	7.9% (1.677) *	6.4% (1.357)	-11.6% (-2.468) **	7.1% (1.519)	-3.8% (-0.803)
J.W. CONSTRUCTION HOLDING SA	1.3% (0.353)	3.5% (0.964)	5.5% (1.539)	-8.5% (-2.358) **	-4.9% (-1.369)	-1.2% (-0.333)	-1.2% (-0.328)	-1.8% (-0.503)
KOMPUTRONIK SA	-1.4% (-0.643)	-2.3% (-1.099)	-8% (-3.77) ***	-0.2% (-0.089)	-1.3% (-0.606)	11.4% (5.329) ***	5.9% (2.789) ***	-0.8% (-0.38)
MDI ENERGIA SA	5.2% (2.008) **	0% (-0.008)	0.1% (0.019)	-0.3% (-0.104)	-1% (-0.382)	-6.9% (-2.653) ***	7.4% (2.861) ***	0.8% (0.29)
MIRBUD SA	-2.8% (-0.751)	2.8% (0.73)	-0.3% (-0.071)	-0.9% (-0.235)	-0.1% (-0.021)	-0.7% (-0.175)	2.7% (0.712)	-2.7% (-0.701)
MOSTOSTAL ZABRZE SA	-1.2% (-0.281)	-2.1% (-0.517)	1.6% (0.398)	-1.9% (-0.454)	4.5% (1.098)	-2.6% (-0.629)	-0.2% (-0.039)	1.1% (0.263)
NEWAG SA	-3.6% (-2.106) **	5.3% (3.112) ***	0.5% (0.294)	2.6% (1.524)	1.5% (0.877)	-1.5% (-0.9)	0.8% (0.441)	-0.3% (-0.171)

Source: *Own work.*

On the basis of the data presented in Table 3, it can be concluded that for six out of the ten companies analysed, not statistically significant above-average rates of return occurred at the date of the event. Therefore, the announcement of a bankruptcy petition filed in bad faith did not result in a sudden sale (or purchase) of shares in these companies. Moreover, out of these six companies, positive rates of return were observed for four of them on that day and negative rates of return were observed for two of them. However, in the case of three companies: Instal Kraków SA, Interbud-Lublin SA and Komputronik SA statistically significant above-average negative rates of return were recorded on the day of the event. It can therefore be concluded that filing a petition for bankruptcy in bad faith resulted in a sale of shares in these companies, which led to the fall of their prices.

What is important, just one day after the event, the share prices of Instal Kraków SA and Interbud-Lublin SA increased (although not significantly compared to the market), and in the case of Komputronik SA there was a minimal repeated price drop of 0.2%. Interestingly, on that day Komputronik SA was the only company among the three discussed to issue an announcement that the petition was unjustified. While it is true that the date of publication of this communication could have had a positive impact on the price on the day following the event, such an effect has not been confirmed in the light of the performed analysis — on the contrary, in the context of increases in the case of the remaining two companies, it seems that the publication of such a communication did not result in a price increase on the day following the event, which could be the subject of further analyses as the number of observations increases.

One day after the event, only for one company, JW Construction Holding SA, a statistically significant and negative above-average rate of return was recorded. However, it cannot be said with certainty that this above-average fall in prices was linked to the announcement of a filing a petition for bankruptcy in bad faith. In the case of this company, there was a 5.5% increase in the return rate on the day of the event, even though investors had more than 2 hours to react to the published information. The price decrease can therefore be linked to previous increases, which certainly had an impact on the adjustment of the rate of return on the day following the event. The case of Erbud SA is also interesting in terms of the situation on day following the event. In the case of this company, strong increases were recorded on the following day, which should be related to the published consolidated report. In addition, on the second day following the event, the company announced the signing of significant contracts, which also resulted in above-average positive rates of return against a broad market.

On the following days, a total of six above-average positive returns and three above-average negative returns were recorded. As a result, in the case of the analysed companies it cannot be concluded that a statistically significant and negative impact of the published information existed — on the contrary, there is a predominance of statistically significant positive interest rates for the analysed stocks.

The results presented above, with no statistically significant impact on the share prices of companies for which bankruptcy applications were filed in bad faith, were also confirmed within the tested group. The results of this analysis, based on the AAR rate, are presented in Table 4.

Table 4. *Results of statistical tests, based on AAR rates, for the analysed group of companies*

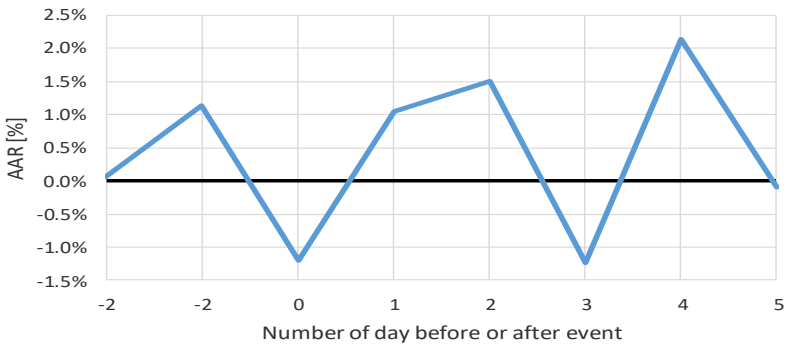
	AAR(-2)	**AAR(-1)**	**AAR(0)**	**AAR(1)**	**AAR(2)**	**AAR(3)**	**AAR(4)**	**AAR(5)**
AAR	0.1%	1.1%	-1.2%	1.0%	1.5%	-1.2%	2.1%	-0.1%
Pos AR : Neg AR	04:06	05:05	05:05	05:05	05:05	02:08	07:03	04:06
Patell Z	0.437	1.498	-1.654 (*)	1.381	1.754 (*)	-0.323	2.279 (**)	-0.177
Adj. Patell Z	0.441	1.51	-1.668 (*)	1.392	1.769 (*)	-0.325	2.297 (**)	-0.178
Adj. StdCSect Z	0.306	1.332	-0.88	0.961	1.422	-0.15	1.685 (*)	-0.255
Rank Z	-0.184	1.167	-0.477	0.974	1.142	-1.292	2.266 (**)	-0.205
Gen. Rank Z	-0.082	1.286	-0.534	1.096	1.096	-0.48	2.01 (**)	-0.471
Gen. Rank T	-0.08	1.256	-0.523	1.072	1.071	-0.469	1.969 (*)	-0.46

Source: *Own work.*

Table 4 shows in the row marked "AAR" the mean above-average rate of return on the subsequent days of analysis for the sample tested. The next line presents the number of positive and negative rates of return constituting the basis for AAR values calculation. The following lines show the results of six statistical tests which were used to assess the occurrence of above-average rates of return. The presented results are the basis for the statement that there is not statistically significant (at least at the level of α=0.05) negative impact of publishing information about a petition for bankruptcy filed in bad faith. None of the tests carried out shows such regularity. Statistical significance of α=0.1 was observed only for the two tests carried out, but it should be noted that this is the lowest significance level, and these results were obtained in the parametric tests with the lowest statistical power.

Therefore, this cannot be a reason to conclude that the publication of information about the petition has a negative impact on the share price of these companies, at a level of significance equal to at least α=0.05. What is more, it can be stated that the market evaluates the companies from the test sample in an efficient manner, as petitions filed in bad faith do not affect the prices of these shares in a statistically significant way. However, high volatility of interest rates was observed for the analysed group of companies and the highest increase was recorded on the fourth day after the event, as shown by the data from Figure 1.

Figure 1. *Average rates of return on subsequent days of the test window*



Source: *Own work.*

In practice, on almost all of the subsequent days under consideration, the sign of the average interest rate was reversed, as shown in Figure 1. The standard deviation of the interest rate on these days is three times higher than the average interest rate recorded in the same period.

In the next step, it was determined whether the publication of the analysed information had a negative impact on the rates of return cumulated in the test window (i.e. from -2 to +5). The results for each company are shown in Table 5.

Table 5. *T-test results, based on the CAR rates, for companies in the test window (-2, +5)*

Company	**CAR Value**	**CAR T-test**
AWBUD SA / PARTNERBUD	5.0%	0.441
ERBUD SA	17.2%	2.176 (**)
INSTAL KRAKÓW SA	10.2%	2.179 (**)
INTERBUD-LUBLIN SA	-2.8%	-0.215
J.W. CONSTRUCTION HOLDING SA	-7.3%	-0.72
KOMPUTRONIK SA	3.3%	0.541
MDI ENERGIA SA	5.3%	0.718
MIRBUD SA	-1.9%	-0.182
MOSTOSTAL ZABRZE SA	-0.7%	-0.057
NEWAG SA	5.2%	1.086

Source: *Own work.*

On the basis of the data in Table 5 in can be stated that no above average and statistically significant negative cumulative interest rates have been confirmed for any of the companies. Surprisingly, for two companies — Erbud SA and Instal

Kraków SA — a cumulative, statistically significant (for α=0.05) and positive above-average rate of return was observed. Therefore, also in the case of cumulative interest rates it cannot be concluded that there is a negative effect of the published information on these companies during a period of one week covering the period from -2 to +5 days from the event in question. A joined assessment of the cumulative interest rate for the analysed group of companies was also made and the results of this analysis are presented in Table 6.

Table 6. *Results of statistical tests, based on the CAAR rate, for the analysed group of companies*

Test	**CAAR (-2,5)**
CAAR Value	3.3%
pos CAR : neg CAR	06:04
Patell Z	1.837(*)
Adj. Patell Z	1.8317(*)
Adj. StdCSect Z	2.0324 (**)
Rank Z	1.1989
Gen. Rank Z	1.8259(*)
Gen. Rank T	1.865(*)

Source: *Own work.*

While previous analyses carried out on the basis of AR, AAR and CAR rates did not confirm the existence of a statistically significant and negative above-average interest rate as a result of filing a petition for bankruptcy in bad faith (on the contrary, they showed a lack of response from investors to such information, which emphasizes market efficiency and the rational, rather than emotional, approach of investors), the results obtained with the CAAR rate can be considered surprising against this background.

In the test window (-2, +5), on average, all companies obtained a positive cumulative rate of return. In addition, five out of six tests showed a statistically significant and positive above-average cumulative rate of return. Although four of these tests are only significant for α=0.1 and the last one for α=0.05, the mere fact that there is a positive above-average cumulative rate of return is somewhat surprising. Such a result, in which the CAAR is positive, should be linked to the fact that the analysed companies revealed positive information after the event in question.

Out of the sample of ten analysed companies, such positive distorting events were recorded in the case of six companies. It should also be noted that these positive disruptive events in most cases weren't known on the day of the event. The boards of companies in the case of which an unfounded bankruptcy petition has been filed tried to additionally demonstrate, in the following days, that such petition had no basis and therefore made every effort to publish positive information after the event in question, which translated into the results for the CAAR rate presented above.

5. Conclusions

The research has shown that it happens that individual companies obtain above-average, negative and statistically significant rates of return on the date of publication of information about filing a bankruptcy petition in bad faith, but there are few of them and on the following day they usually make up for losses. The absence of a negative and statistically significant above-average rate of return is also evidenced by the results of the tests carried out for the examined sample of companies. None of the tests was statistically significant at least at α=0.05 on the day of the event or on any other day thereafter. Characteristically, there was also a high variability for AAR rate on the examined days.

Considering the cumulative rates of return obtained for individual companies, it can be said that the research also failed to confirm above-average negative interest rates in the test window. On the contrary, there were two companies for which the above-average cumulative rates of return were positive. However, when analysing the cumulative rate of return for the test sample, a statistically weakly significant value of above-average positive rates of return was found.

The above-mentioned conclusions from various variants of the conducted research confirm the hypothesis of market efficiency and the absence of irrational decisions on the part of investors who hold shares in companies in the case of which bankruptcy petitions have been filed in bad faith. As a result of the conducted research it can therefore be assumed that the filing of an unfounded bankruptcy petition does not, in the short term, have a statistically significant negative impact on the share price of the company being the subject of the petition. It should be noted, however, that in each case the boards of directors reacted promptly to the filing of the bankruptcy petition and immediately issued a declaration that it was unfounded. This could have had a significant impact on investors' reactions. Moreover, a statistically weak but positive effect on the group of surveyed companies in the case of a cumulative rate of return was noted. It may be a consequence of the appearance of other information concerning the examined companies in the analysis window.

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