

Impairment of Assets of the Issuers in the Condition of Economic Crisis – Evidence from the Warsaw Stock Exchange



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Abstract. The main goal of this paper is to examine the impact of on the performed impairment of assets on the market valuation of companies listed on Warsaw Stock Exchange in the conditions of an economic crisis caused by the Covid-19 pandemic. The research undertaken in the project helps recognize the correct behaviour (in the short term) of the issuers' shares in a period of uncertainty and increased volatility of securities prices on capital markets. To this purpose, was adopted a research hypothesis indicating that disclosure of information about the impairment of the company's assets results in negative abnormal returns of their share prices, which was dominant position in the research of previous authors. The research undertaken in the article helps identify the rules of behaviour whether the reaction of investors on updating the company's assets in crisis conditions is different than in times of prosperity. The main hypothesis will be verified using the event study methodology. The author intends to verify whether the level of abnormal returns occurring on the days adjacent to the announcement regarding impairment of assets is significantly different from the average level. The subject of the article will be all reports on impairment of assets submitted by 140 biggest issuers listed on the main trading floor in WSE during the Covid-19 pandemic (year 2020). The effect of the article will be interpretation of certain relationships that characterize the stock exchange in Poland as well as an indication of the importance of the occurrence of impairment of issuers' assets for their share prices in economic crisis situation.

Key words: capital markets, accounting, economic crisis, shares, impairment of assets, event study.

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Introduction

Hundreds of different types of information flow into the capital market every day. Some of them concern the general economic aspects, others refer to changes being introduced in the field of economic or social policy. Another group of messages that reaches investors are those that relate to the direct context of an individual stock exchange issuer. They include recommendations of stock exchange analysts, information on the company's dividend policy (or it changes), share splits or re-splits or insider transactions [1]. This information may cause short-term volatility in the market valuation of issuers.

The information that is sent to investors on a daily basis also includes accounting data from the financial reporting system. Using them to describe the property and capital situation of economic units allows to somehow quantify the results of their economic activity. The external demand for accounting data of an entity may result from some asymmetry of information between managers and other market participants. The latter have a difficult opportunity to assess the profitability of the entity's business, where they want to invest their money. This situation may be caused by the owners' motivation to exaggerate their financial performance. Published accounting data allow external investors to verify the reliability of information coming from high management levels of entities. The correctness of assessments of their activities confirmed by figures enables the proper functioning of the market [2].

Since the 1960s, an attempt has been made to explain the nature of the relationship between accounting data and market valuation of securities of individual issuers. The interpenetration of accounting with capital markets led to the creation of an area of scientific exploration called capital markets research in accounting. The first authors writing in that area attempted to explain the investor's perception of the content of companies' financial results [3] and the immediacy of the

market's reaction to its transmission [4]. That area is still being developed by a multitude of scientists conducting research combining accounting with capital markets. In subsequent years, the authors sought more and more relationships between accounting data and the market valuation of listed entities. Attempts have been made to prove the significance of financial results for shaping securities rates only when combined with a regression model based on the least squares method [5]. There was also an increase in investor activity in the periods of quarterly results announcement associated with some underestimation of optimistic forecasts of analysts related to the periodically higher net result [6].

Apart from the above, there is a lot of evidence in the literature that investors use accounting data provided by issuers [7; 8] to make investment decisions. It can be undoubtedly stated that information from the financial reporting system is a factor of variability of securities prices. Investors observing data from the financial reporting system may see more or less profitable entities. Without them, such a situation would not have taken place and there could have been a situation of overstatement of the market valuation of entities that do not perform well and underestimated those whose financial condition remains impeccable.

One of the sources of information affecting on securities prices are reporting changes in the value of issuers assets. This factor may result in the volatility of the issuers' share prices due to the decrease (or increase) in the value of their assets. In this article the author wants to verify how information about change the value of assets affects short-term market valuation of biggest and most liquid issuers listed on the Warsaw Stock Exchange (WSE), which are grouped in three main indices of polish capital market so called WIG20, mWIG40 and sWIG80 in the economic crisis condition (caused by COVID-19).

To this purpose is necessary to examine the capital market reaction to information relating to reporting of assets impairment by companies listed in the WSE in the form of a current report. Similar topics were the subject of research by few authors [9, 10, 11, 12, 13, 14]. However, they did not focus on the general economic conditions for conducting the analyzes. The author's research contribution to the state of knowledge is an attempt to verify how the market will react to such information in a situation when the specter of a serious economic crisis hangs over it, which was caused by a pandemic of COVID-19 [15]. This paper will present a new approach. Main purpose of this paper is to show how the market will react to such information in a situation where the prices of securities have already discounted a lot of negative information. Such a reaction may be different from that observed in earlier studies.

Despite research on the impairment of assets undertaken i.a. by Polish authors in various cross-sections of this event none of the previous researchers, undertook to verify the link of impairment of assets to the market valuation of stock exchange issuers in the case of economic downturn. Such studies will be undertaken in this article to supplement information in this area.

The main task of the article is to examine the impact of the reported impairment of assets on the market valuation of issuers in crisis condition caused by COVID-19 pandemic. The Author wants to verify whether the disclosure those information in the period of economic downturn will cause similar reaction as in previous topic in this area.

To this purpose, was adopted a research hypothesis indicating that disclosure of information about the impairment of the company's assets during the COVID-19 crisis (year 2020) results in negative abnormal returns (AR) of their share prices, which was dominant position in the previous research. The research undertaken in this article helps identify the rules of behaviour (in the short term) whether the reaction of investors on updating

the company's assets in crisis conditions is different than in times of prosperity.

The main hypothesis will be verified using the event study methodology [3, 16]. Author intends to verify whether the level of achieved AR occurring on the days adjacent to the announcement regarding impairment of assets is significantly different from the average level. The subject of the article will be all current reports about impairment of assets submitted by 140 biggest issuers of the main trading floor in polish capital market (WSE) in times of the Covid-19 pandemic (year 2020). Results will be compared with investors reaction on impairment of assets proven in earlier studies.

The conclusions obtained from the statistical verification will allow to arrive at general formulations characterizing the occurrence of impairment of assets in the context of market capitalization of their companies in the „abnormal” conditions of economy functioning.

The effect of the article will be interpretation of certain relationships that characterize the stock exchange in Poland as well as an indication of the importance of the occurrence of impairment of issuers' assets for their share prices in economic crisis situation. The verified hypotheses can be used for development by scientists dealing with methodology of event study and the value of assets in any other capital market in the world.

Impact of assets impairment on the market valuation of issuers during the COVID-19 crisis

Transmission by the issuer of a message indicating that an impairment of assets has been carried out may have a negative effect on the market valuation of its shares, which should result in a decrease in the listing of shares in a given company. This is due to the recognition of a write-offs on the cost, reducing the financial result for the period. Investors receiving such information are reviewing their expectations regarding the company's future profits. As a rule, this involves the sale of its shares on the days following the date of publication of the information regarding the impairment of assets. The

main research question that bothers the author of the paper is, however: „Whether in the conditions of the expected economic downturn resulting in weakening investors' sentiment to risky assets (such as shares) and significant decreases in the market valuation of companies listed on stock exchanges, a similar market response to the fact of providing information on impairment of assets will be observed ?”.

Such a dramatic collapse of the economy will lead to mass bankruptcies of enterprises, a decrease in employment and a significant reduction in the standard of living of many people. The vision of the economic crisis caused by the COVID-19 is of great importance for the global financial market. The outbreak was an „black swan” on the stock market, which is an event that has a large impact on investors' decisions that could not have been foreseen [17]. It usually causes serious consequences for the stability of the financial system in the world, and the fact that they cannot be predicted prevents any preparation for its occurrence.

The impact of COVID-19 information on the behavior of stock exchanges has been evident since the end of February 2020. The panic peak fell in mid-March, when the largest global indexes recorded weekly drops exceeding 20% [18]. This bear market did not bypass the WSE. The Warsaw Stock Exchange Index (WIG) set levels not seen since the financial crisis of 2008-2009. Despite the corrective „dead cat bounce” [19], which took place in April, investors' sentiment to investing their funds in slightly more risky assets remained miserable.

From the paper's point of view, it is worth considering how coronavirus will affect the value of assets of listed companies listed on the main floor of WSE. The wide market has recently discounted a lot of negative information. These are included in historically lowest levels of unlisted shares since the years 2011–2012. In connection with this, confirmation in these conditions of the negative impact of asset impairment on the market valuation of companies previously determined on the Polish market [20, 14] is being called into question.

The author of the paper intends to check whether in the year of the spread of „coronavirus crisis” (2020) on the WSE, the above mentioned relationships could be noticed in the days accompanying the announcement of impairment of assets. The author's own research on the impact of the write-offs on the market valuation will allow to deepen the knowledge of capital market participants in the field of short-term determinants of shaping the price of shares of individual issuers in the conditions of economic slowdown.

The paper's effect is to indicate and interpret the relationships that characterize the stock market in Poland as well as to indicate the importance of the occurrence of impairment of issuers' assets for their share prices in times of economic uncertainty resulting in increased volatility of securities prices. The verified hypotheses can be used for further development by scientists dealing with both the methodology of event analysis and the value of assets.

Theoretical aspects of impairment of assets and market valuation of stock exchange issuers

As previously noted, the capital market receives a lot of different kinds of information every day. They may more or less concern individual issuers and influence the prices of their securities. Undoubtedly, one of the factors causing the variability of financial instrument prices is accounting data.

Ray Ball, Phill Brown [3] and William Beaver [4] were mentioned in the introduction as undoubtedly pioneers pointing to the importance of data from the accounting system for the market valuation of stock exchange issuers. Based on the growing popularity of the efficient market hypothesis, in the late 1960s, they attempted to quantify the assessment of the relationship between the reported financial result and the market valuation of entities listed on the American capital market.

The growing interest in the capital market research trend in accounting has led the researchers of stock exchanges to undertake research analyzing

individual elements of accounting data in the context of their relationship with the volatility of securities prices. Nevertheless, the analysis of the price-forming nature of the impairment was undertaken for the first time nearly 20 years later after the start of research in this area.

John Strong and John Meyer [9], moved by the growing number and value of American corporations' reductions in the book value of assets, decided to indicate the importance of impairment write-off for the valuation of securities. Their research was the first to attempt to assess the dependence of impairment by stock exchange entities with the reaction of investors manifested by the volatility of securities prices.

Using the methodology of event study, J. Strong and J. Meyer based on 78 companies from the American stock exchange, which in the years 1981–1985 revealed impairment in their financial statements, have attempted to determine their significance for the market valuation of the shares of these issuers. The 120-day event window they created covered each time 60 session days before and 60 days after the fact of announcing the impairment write-off. Initially, the authors did not find any statistically significant AR in the analyzed event window. However, dividing it into shorter periods made it possible to determine the importance of the impairment write-off for „the increase in the wealth of the company's shareholders". 10 days following the event, the authors recorded statistically significant positive AR, which indicated a positive impact of the reported impairment on the share prices of stock exchange issuers. Moreover, the additional positive impact also occurred before the actual disclosure of information to investors. This could indicate the existence of a certain privileged group of investors making investment decisions before the actual announcement of impairment write-off.

The publication of J. Strong and J. Meyer was a certain motivating factor to verify the conclusions drawn by the authors in the research community. A

year later, John Elliott and Wayne Shaw [21] proclaimed the occurrence of lower return on days accompanying the moment of announcing the information about the „large" write-off. Moreover, they noticed that companies reporting significant impairment have lower returns than competitors in the industry not reporting it within 6 months of the impairment write-off announcement. In the following years, an increasing number of authors took up the subject of update of issuers' assets for the market valuation of their securities. In one of them, Howard Bunsis [22] indicated that the market reaction to information announcement is not uniform. Its direction is evidenced by the fact whether the impairment of assets will be related to the expected cash flows. Impairment, accompanied by large negative cash flows, was characterized by a much stronger negative market reaction in relation to write-offs booked only on an accrual basis.

The authors also pointed out the existence of a negative reaction of the market in the case of the announcement of impairment write-off exceeding 1% of the balance sheet total of the issuer [23,24]. It was claimed that the correlation between the amount of the write-off and the return in the short term is not as strong as the correlation between the amount of the write-off and the delayed return. The observed delayed correlation was supposed to indicate some investors' predictions of decreases in prices of goods offered by issuers [25]. It was also noted that the return from companies reporting the impairment depends to a large extent on the timeliness of their disclosure. Moreover, the impairment is made public at a „less appropriate" time compared to the other output elements, resulting in statistically significant volatility of securities prices. [26]. Furthermore, it could be noticed that the market reaction to the write-off (due to goodwill impairment) was also related to the credibility of the explanations of the company's authorities regarding the reasons for the write-off [12].

Methodology of research

Verification of the importance of updating the entity's asset value will be calculated using the event study methodology. It allows to determine the impact of a certain event on the returns of individual securities (in this case shares). Event study, next to simulation methods, is the most commonly used method of confirming semi-strong information efficiency. It is a tool used to react investors to the occurrence of a certain event, which also resulted from its name [27].

Event study methodology has been developed over the years by researchers in the field of finance, which does not exclude the possibility of its application in other areas of social sciences such as management, economics and accounting [28]. This justifies its application for examining the impact of providing information on impairment write-offs on the market valuation of listed entities listed on the WSE during Covid-19 crisis, which are the subject of these considerations.

A milestone in the development of event study methodology was the work of two research teams published in a very similar time. The first concerned the impact of the report containing information on the financial results of listed companies on their market valuation, carried out by Ray Ball and Phillip Brown [3 1968]. While examining the net financial results different from market expectations, they noticed their significant nature for investors. Although the authors themselves claimed that they dealt with the information content of the published periodic report rather than testing the information efficiency, their contribution to the methodology being analyzed is indisputable. There is no doubt that these authors were the first to examine the impact of data from the financial reporting system on shaping securities rates. They also introduced the definition of an AR that is the difference between the actual rate of return achieved that day and the expected rate.

The second publication introducing the event study methodology to global research has been implemented by Eugen Fama's research team.

Investigating the wide period of the event, which was information about splits, they attempted to verify the aspiration of stock prices for new information. Thus, they tried to determine the existence of capital market information efficiency. In examining cases of 940 news on the distribution of shares from 1927-1959 in the event window covering 29 months before the information about it and 30 months after they noticed that the market was discounting this message positively. Attempts were made to explain this by rising investors' expectations regarding the future level of dividends.

The event study methodology itself includes several stages that should be carried out in the correct order. These stages should include, first of all, defining the event and its duration (indication of the so-called event window), determining the measures determining level of expected and AR and estimation of the expected rate of return (in the so-called estimation window) using one of its estimation models [29].

The main element needed to conduct an event study is an announcement or event whose new information content may have an impact on future expected cash flows from the issuer's operations or on the discount rate it uses [30]. Importantly, from the point of view of further proceedings, this advertisement must be unexpected by the market. Its earlier signaling would make it possible to include it in prices in line with the effective market hypothesis.

One of the important steps in event study methodology are specifying the event window (in this project, identical to the issuer's submission of a report on the write-off) and an estimation window (used to calculate the expected return) allows to quantify how the market is able to respond to the above-mentioned revision of the asset value.

In the simplest terms, the event window is the time period during which the impact of the event on the market valuation of securities of listed companies is examined. Its length is not constant. It may only cover the day of occurrence of the event, several subsequent trading sessions, or even a period of a year. Analyzing literature, you can find

a distinction between fixed-width and variable-width windows. The use of the first is important especially when conducting research on a large research sample. Possible estimation errors can then compensate each other. However, this situation does not always occur (due to limited access to data, for example), so it is preferable to use variable-length event windows that allow the researcher to adjust its length to each observation individually [31].

Another important element of event study is the definition of the estimation window. It is here that the model parameters (models) are estimated, which will be used to calculate first the expected rate of return on day t , and then the surplus. The expected return is to reflect the „normal” behavior of investors when the market would not receive information about the analyzed event [32]. It is important that it be relatively longer than the event window [33]. The estimation of the expected return takes place in it, which is to determine the shaping of public company securities prices that would have taken place if the event announcement had not been made public. Sudi Sudarsanam [34] pointed to the existence of the seven most commonly used models, which he divided into: single-index, market and portfolio. In this paper will be used one of the market model created by William Sharpe [35] (Sharpe single-index model).

After determining the expected return, a researcher using event study can calculate AR that are at the core of the described methodology. This task is definitely simpler than using one of the above models for estimating the expected return. The AR is the difference between the actual realized return on the day of the event window and the calculated expected return. In the simplest terms, this is illustrated by the following formula:

$$AR_{it} = Rit - E(Rit),$$

where: AR_{it} – abnormal return of security i in period t , Rit – realized return of security i in period t , $E(Rit)$ – expected return of security i in period t .

The AR calculated in this way can be positive, negative or zero. The additional rate mark on day t

indicates how the event will affect the market valuation of the issuer. In a situation when calculated return is positive, then it can be said that the event examined has a positive effect on the market valuation of the entity being tested, increasing its value. In the opposite case, when the result AR has a negative value, it means that the event was negatively assessed by investors. The market value of the issuer will then fall. The least common case occurs when the additional return is zero. In such a case, it should be assumed that the analyzed event has no impact on the stock exchange price of the tested company [36].

The last of the presented stages of the event study methodology includes an assessment of the statistical significance of the calculated AR. The obtained results may result from the „standard” price volatility recorded on global capital markets. Therefore, it is necessary to adopt the null hypothesis that there is no impact of the event on the formation of security prices, which is characterized by a deficit of statistically significant increase return. The opposite alternative hypothesis is based on the existence of the impact of the information presented about the event on the market valuation of issuers, manifested in statistically significant abnormal returns. In order to verify the truthfulness of any of the indicated hypotheses, appropriate statistical tests are used to check whether the calculated AR are significantly different from zero [30].

According to the research hypothesis adopted in the introduction, the announcement of the write-off will have a negative impact on the market valuation of biggest issuers listed on the WSE. Negative interaction between the indicated variables is expected to manifest itself in the occurrence of negative AR on shares of issuers listed within the WIG20, mWIG40 and sWIG80 indices on the days following the date of announcement of information about the write-off. Moreover, the author wants to verify whether the occurrence of these AR will also take place in the days preceding the day on which the examined information was made available.

Table 1 Issuers listed on the main trading floor of WSE qualified to the research sample (ranked by percentage in the index)

WIG20	mWIG40		sWIG80			
PKOBP	INGBSK	COMARCH	ASSECOSEE	STALEXP	MANGATA	PEKABEX
PZU	KETY	TSGGAMES	ASSEC OBS	ABPSL	ZEPAK	ARCTIC
CDPROJEKT	ASSECOPOL	11BIT	MENNICA	SELVITA	PCCROKITA	POLNORD
PEKAO	MILLENIUM	CIECH	ALUMETAL	PBKM	DEBICA	MEDICALG
PKNORLEN	AMREST	ECHO	AGORA	RAINBOW	ASBIS	UNIMOT
KGHM	KRUK	DOMDEV	NEWAG	ATAL	POLIMEXMS	CIGAMES
LPP	KERNEL	FAMUR	WAWEL	CPRGROUP	KRUSZWICA	OAT
SANPL	BUDIMEX	ORBIS	PEP	VIGOSYS	OVOSTAR	TRAKCJA
DINOPL	INTERCARS	AMICA	ENTER	POLICE	WIELTON	EKOEXPORT
CYFRPLSAT	HANDLOWY	CLNPHARMA	APATOR	KOGENERA	R22	VOTUM
LOTOS	GTC	VRG	RYVU	DATAWALK	PGSSOFT	MLSYSTEM
PGNIG	WIRTUALNA	LIVECHAT	SANOK	AMBRA	BIOTON	ULTGAMES
MBANK	EUROCASH	FORTE	NETIA	OPONEO.PL	TOYA	MERCATOR
ORANGEPL	ENERGA	NEUCA	SNIEZKA	TIM	ARHCICOM	RAFAKO
PGE	BENEFIT	PLAYWAY	ACAUTOGAZ	PHN	TORPOL	SERINUS
PLAY	ENEA	PKPCARGO	BORYSZEW	VOXEL	UNIBEP	ELBUDOWA
CCC	DEVELIA	MABION	FERRO	BOS	ASTARTA	IDEABANK
ALIOR	GRUPAAZOTY	STALPROD	AUTOPARTN	BSCDRUK	MCI	BOOMBIT
TAURONPE	BNPPL	BOGDANKA	MLPGROUP	ATMGRUPA	INSTALKRK	BAHOLDING
JSW	GPW	GETIN	COMP	ELEMENTAL	LENTEX	PRAIRE

Based on: Historical indices portfolios of WSE after annual revision on March 2020. Available at: <https://gpwbenchmark.pl/en-notowania> (accessed November 18, 2020).

This is to verify whether there is a certain privileged group of investors who have access to confidential information about the impairment.

The author's procedure was taken from the methodology of the first study to verify the significance of impairment on the prices of securities in the 1980s by J. Strong and J. Meyer [9]. He also used the event study methodology for this purpose, which allows to estimate the impact (or lack thereof) of a broadly understood event on the shaping of securities prices.

The hypothesis is to be verified by searching for messages indicating the occurrence of impairment of assets on this account, among the current reports provided by indicated issuers in the Electronic Information Transfer System (ESPI) during the COVID-19 crisis year 2020. The list of companies qualified for the research is presented in *Table 1*.

After obtaining all information regarding impairment of assets in the analyzed period, it will be necessary to group them and chronological

order for each issuers. Such prepared reports on the impairment of assets (together with exact dates of their publication) will be the basis for taking quotations of share prices of issuers reporting impairment in the analyzed period. The calculation of daily returns on shares together with the definition of the event window in which the impact of impairment on the market valuation of listed companies will be examined will be another of the author's steps taken as part of the research task. The estimation of AR together with statistical verification of the results will allow for the conclusion regarding the verification of the importance of update of assets due to impairment for the market valuation of issuers in a short-time horizon in economic crisis conditions.

Overall plan of research can be outlined in several steps necessary for their proper conduct. They will be as follows:

- collecting empirical data extracted about impairment of assets in 2020 year from the ESPI;

- construction of a database containing information about the publication of current reports concerning impairment of the assets of biggest issuers listed on the WSE;

- defining the event window in each of the cases where the issuer disclosed information about making an impairment of assets;

- calculation for each event (identical to the passing of information on impairment write-offs) of the expected return based on stock quotations from the estimation window;

- estimation of AR in each event window;

- statistical analysis of calculated average AR (AAR);

- preparation of conclusions regarding the impact of impairment of assets on the market valuation of indicated issuers listed on the WSE.

Event study methodology used in this paper required to fulfill few abovementioned stages. According to them, in order to study the impact of the impairment on the shares of the indicated issuers, the author constructed a symmetrical seven-day event window for each qualified cases to the research sample. It covered three session days preceding the day of publishing the report on the impairment write-off (t_{-3} , t_{-2} , t_{-1}), publication day (t_0) and three session days immediately following the disclosure of the information studied (t_{+1} , t_{+2} , t_{+3}). As in the study of the pioneers of this type of research, the author wanted to verify whether in the days immediately preceding the date of publication of the information on the write-off, there could be statistically significant AR indicating the disclosure of the impairment to a certain privileged group of recipients.

From the point of view of the conducted research, it was important to verify whether in the adopted event window, in each of the qualified announcements about impairment of assets during the COVID-19 year, there are no disruptive events (e.g. information on dividends, analysts' recommendations, block trades, changes in national policy). The occurrence of such a situation may disrupt the cognitive value of the obtained

results. The results could not capture the proper significance of the impairment write-off for the market valuation of biggest issuers listed on the WSE during economic crisis, because in the analyzed event window, investors could be more strongly influenced by information with a different content.

Before estimation the AR should be calculated the expected returns. To this case has been used Sharpe single-index model [35]. Model parameters were calculated using the least squares method. Estimation window has been set to 30 sessions days before the seven-day event window. It started from day t_{-34} to day t_{-5} (in relation to day of announcement the information about impairment of assets on day t_0). The return on the market portfolio was calculated using the WIG quotations (broad market index of WSE).

Last part of research procedure was statistical verification of obtained results. To this have been used non-parametric Wilcoxon matched-pairs test [37] (for AAR in each day of event window) and Cowan Generalized Sign Test [38] (for cumulative abnormal returns – CAR). There are one of the most appropriate tests used to statistical verification of results obtained under event study methodology [39].

Results of conducted research

Reviewing the current reports of the above mentioned companies in the Covid-19 year 2020, 42 announcements with a reference to the write-off were found. They were provided by 26 biggest issuers indicated in *Table 2*.

14 of the previously qualified cases of information being made available, indicating the occurrence of a write-off, was also rejected. Together with this announcement, the issuer has made several other information public. According to the author, it could have had more influence on the behavior of investors than the write-off itself, therefore it was decided to remove this case from the sample.

After a preliminary selection of the impairment write-offs found in 2020 in current reports, it was decided to qualify 28 events to the sample.

Table 2. Information about impairment of assets submitted by biggest issuers listed on the WSE in the form of current reports in 2020

Issuer (WIG20)	Date of current report	Issuer (mWIG40)	Date of current report	Issuer (sWIG80)	Date of current report
ALIOR	07.08.2020	ENEA	27.10.2020	AGORA	30.04.2020
CCC	21.09.2020		11.08.2020		17.01.2020
JSW	28.07.2020		19.05.2020	BAH	07.08.2020
PGE	31.08.2020	ENERGA	14.02.2020	BIOTON	10.04.2020
	13.03.2020		23.07.2020	BOOMBIT	28.02.2020
	14.02.2020		19.05.2020	BORYSZEW	26.05.2020
08.05.2020			09.03.2020		
PGNIG	08.10.2020		31.03.2020	DATAWALK	04.09.2020
	12.05.2020	FAMUR	10.02.2020	ELEMENTAL	27.02.2020
	14.02.2020	GRUPAAZOTY	25.03.2020	PEP	30.12.2019
PKNORLEN	04.05.2020			POLNORD	30.06.2020
PZU	25.08.2020			RAFAKO	24.09.2020
TAURONPE	05.08.2020			RAINBOW	27.06.2020
	17.03.2020			SANOK	06.03.2020
	04.03.2020			TRAKCJA	18.03.2020
				ZEPAK	23.09.2020
					26.03.2020

Based on: current reports submitted to ESPI by indicated issuers. Available at: <http://infostrefa.com/infostrefa/pl/index/> (accessed December 2020).

Table 3 indicates the companies which made the write-offs in the analyzed period, together with the dates on which such information was made public. It also includes information on which group of assets were impaired and the amount of write-off (with it relations to sum of issuer assets). In the event that the issuer revalued more than one group of assets and it was not possible to indicate which asset was specifically affected, the author decided to create a separate category of write-offs, i.e. „Other”.

Next steps of event study methodology consist estimation of expected returns (using Sharpe single-index model) and calculation of AR for each case qualified to research sample. As mentioned above for each qualified current reports about impairment of assets was created seven-day event window. It covered three session days preceding the day of publishing the report on the impairment write-off (t_{-3}, t_{-2}, t_{-1}), publication day (t_0) and three session days immediately following the disclosure of the information studied (t_{+1}, t_{+2}, t_{+3}). In this way were calculated 196 AR.

Their values are presented in Table 4. The author also added there CAR which is a sum of seven singles AR in event window.

In order to obtain confirmation of the results of the study it was necessary to carry out a statistical tests to verify their significance. To this purpose have been used non-parametric Wilcoxon matched-pairs test for each AAR and Cowan Generalized Sign Test desgined for CAR. Both of them base on the value of Z statistic. Therefore, the author used the assumptions of those tests to check the statistical significance of the calculated AR. Additionally, in table 4 have been put results of statistical verification of AAR and CAR.

As can be read from the table above, the lowest AAR was recorded on the day t_{+1} , which is the next day after a day which news was communicated to the investors about the impairment write-off. Importantly, only on this day and day t_{+3} negative AARs could be recorded (however, on t_{+3} it was much closer to zero). The significantly lower AAR at day t_{+1} may suggest that the market is discounting

Table 3. All qualified cases of current reports about impairment of assets submitted by biggest issuers listed on the WSE in 2020

Issuer	Date of current report	Number of current report	Amount of write-off (in mln PLN)	% of balance sheet total	Group of impaired assets
WIG20					
ALIOR	07.08.2020	37/2020	676	0,87	Other
CCC	21.09.2020	61/2020	448,7	6,65	Other
JSW	28.07.2020	28/2020	431	3,17	Tangible fixed assets
PGE	31.08.2020	25/2020	1012	1,35	Other
	13.03.2020	10/2020	7100	8,78	Tangible fixed assets
	14.02.2020	5/2020	79	0,10	Tangible fixed assets
PGNIG	12.05.2020	18/2020	770	1,34	Tangible fixed assets
	14.02.2020	6/2020	837	1,46	Other
PZU	25.08.2020	28/2020	1594	0,42	Intangible assets
TAURONPE	05.08.2020	37/2020	227	0,57	Other
	04.03.2020	5/2020	914	2,13	Other
mWIG40					
ENERGA	08.05.2020	39/2020	502	2,33	Other
	31.03.2020	26/2020	340	1,62	Other
ENEA	27.10.2020	47/2020	254	0,81	Long-term investments
	11.08.2020	18/2020	1027	3,29	Tangible fixed assets
	19.05.2020	6/2020	53	0,17	Long-term investments
GRUPAAZOTY	25.03.2020	17/2020	28,8	0,19	Long-term investments
sWIG80					
AGORA	30.04.2020	20/2020	59,5	3,04	Long-term investments
	17.01.2020	1/2020	11,2	0,56	Long-term investments
BOOMBIT	28.02.2020	6/2020	5,9	0,89	Intangible assets
ELEMENTAL	27.02.2020	26/2020	6,06	0,57	Other
PEP	30.12.2019	40/2019	16	0,65	Long-term investments
POLNORD	30.06.2020	45/2020	52,2	5,20	Tangible fixed assets
RAFAKO	24.09.2020	50/2020	166,5	12,78	Other
RAINBOW	27.06.2020	25/2020	13,2	2,44	Other
SANOK	06.03.2020	2/2020	41,6	8,85	Long-term investments
TRAKCJA	18.03.2020	8/2020	252,4	17,00	Other
ZEPAK	23.09.2020	45/2020	289	9,27	Tangible fixed assets
Based on: current reports submitted to ESPI by indicated issuers. Available at: http://infostrefa.com/infostrefa/pl/index/ (accessed December 2020).					

Table 4. AR in individual days of the event window for each qualified case of reporting impairment in current reports in the COVID-19 2020 year (in percentage point)

Issuer/ Day of event window	t_{-3}	t_{-2}	t_{-1}	t_0	t_{+1}	t_{+2}	t_{+3}	CAR
ALIOR	3,09%	1,85%	-0,58%	-1,87%	-0,30%	8,14%	-0,52%	9,80%
CCC	-2,81%	-1,66%	5,43%	-0,59%	-6,10%	2,22%	-2,61%	-6,11%
JSW	-2,39%	-0,09%	-2,40%	-3,06%	-9,24%	-3,50%	6,23%	-14,45%
PGE	-3,99%	0,09%	3,12%	-2,63%	-0,14%	1,10%	1,15%	-1,30%
	2,77%	-0,56%	-1,70%	-5,64%	8,16%	11,73%	-1,98%	12,79%
	2,77%	-1,27%	-3,04%	-1,12%	-0,86%	-0,86%	-1,98%	-6,36%
PGNIG	1,53%	-0,84%	-1,13%	0,25%	-0,95%	0,95%	-1,41%	-1,59%
	2,18%	0,53%	0,74%	-0,85%	2,54%	1,04%	0,76%	6,93%
PZU	0,45%	0,52%	0,33%	-0,10%	-1,50%	0,15%	-0,22%	-0,37%
TAURONPE	-2,63%	-2,28%	-0,77%	-5,49%	-1,57%	-3,39%	-1,86%	-17,99%
	0,49%	3,51%	1,05%	-0,47%	-0,93%	2,21%	2,35%	8,20%
ENEA	0,31%	-0,83%	1,40%	-1,27%	5,61%	-2,50%	-1,57%	1,16%
	-2,08%	-0,36%	1,39%	1,86%	-1,07%	0,52%	-2,26%	-2,00%
	1,35%	-0,94%	-0,78%	3,27%	-2,12%	-0,97%	-2,81%	-2,99%
ENERGA	0,26%	-0,90%	1,20%	-1,12%	0,11%	-3,02%	-0,16%	-3,63%
	4,44%	4,47%	-1,09%	2,04%	1,32%	-0,27%	-0,48%	10,44%
GRUPA AZOTY	-5,32%	3,90%	-0,49%	0,21%	-2,34%	-0,20%	-2,33%	-6,57%
AGORA	0,36%	-0,54%	-2,47%	5,93%	2,02%	0,96%	0,50%	6,76%
	8,16%	1,42%	-0,10%	-0,44%	-2,37%	2,32%	-0,62%	8,37%
BOOMBIT	0,06%	3,06%	7,62%	9,23%	9,63%	-16,19%	7,55%	20,97%
ELEMENTAL	-7,53%	4,73%	-6,10%	-1,71%	-16,03%	11,49%	8,10%	-7,05%
PEP	-2,33%	-1,30%	0,23%	-0,60%	-0,86%	2,30%	-1,47%	-4,03%
POLNORD	-1,48%	-2,17%	0,23%	4,80%	-3,14%	-3,04%	-1,06%	-5,87%
RAFAKO	1,70%	1,20%	-0,98%	-0,42%	5,01%	-8,24%	-0,67%	-2,40%
RAINBOW	-0,99%	-3,84%	-2,16%	-7,16%	-4,88%	5,49%	-0,04%	-13,59%
SANOK	-7,75%	2,73%	0,97%	4,64%	2,91%	8,74%	1,41%	13,66%
TRAKCJA	0,42%	11,47%	1,74%	8,16%	-2,85%	1,67%	2,07%	22,68%
ZEPAK	2,40%	-0,45%	0,26%	2,93%	-1,42%	0,23%	-0,37%	3,57%
AAR	-0,23%	0,77%	0,07%	0,31%	-0,76%	0,68%	0,20%	1,04%
Z statistic of Wilcoxon matched-pairs test / Cowan generalized sign test	-0,022	-0,66	-0,154	-1,07	-0,797	-0,956	0,865	0,671

* statistically significance at level $p < 0,05$.

Based on: own calculation based on the share quotations. Available at: <https://stooq.pl/t/?i=523>, (accessed December.2020).

information about the impairment of the assets of individual issuers. It is surprising that there is no negative AAR on day t_0 , when the sharpest sell-off of shares should be expected as a result of such negative news. A more detailed analysis of the timing of providing investors with the 28 current reports selected in the sample shows that the vast majority of issuers submitted such a report after the close of the trading session. The rationale is

largely due to the lack of statistically significant negative AARs on the date of disclosure of the asset impairment write-down.

Therefore, it would seem that the negative market reaction observed in the research of previous authors should appear on day t_{+1} and perhaps in the next two events captured in the window. While on the day following the publication of the current report on the impairment of assets, a lower AAR

(-0.76%) can be observed, on the next two days the calculations indicate positive AARs (0.68% on day t_{+2} and 0.20% on day t_{+3}).

From the point of view of the significance of the conducted research on the significance of impairment of assets for the market valuation of companies listed on the WSE during the economic crisis caused by Covid-19, it would be important to verify the obtained AAR values in terms of their statistical significance. For this purpose, the non-parametric tests mentioned above were used. As can be seen the results on any of days of the event window showed no statistical. Despite the clear lower AAR on the next day the information on the write-off is made public, the non-parametric test applied did not show that the impairment of assets would cause a decrease in the market valuation of the shares of issuers significantly different from that resulting from typical volatility of prices on capital markets. Moreover CAR is also insignificant, which excludes the impact of the write-off on the market valuation of analyzed issuers in the entire event window.

It is also important that in the days preceding the announcement of the analyzed event, no statistically significant rates of return were recorded. This means that it cannot be established that there is a certain group of investors with earlier information on impairment who could make appropriate decisions before the actual disclosure of such information.

Based on the indicated in table 4 AR the obtained results can't confirm the main hypothesis talking about the short-term negative reaction of investors to the information about the impairment of assets during the COVID-19 crisis year 2020.

Conclusions

In the mass of information received daily by the capital markets, accounting data is undoubtedly one of the most important for making investment decisions. In this group one can indicate announcements concerning the financial result achieved, the level of sales achieved, or just announcements

concerning the revaluation of assets by the issuer in the form of impairment write-off. The results of many earlier researchers indicate that the announcement of such information is accompanied by a decrease in the market valuation of the issuer.

Main purpose of this paper was an examination the capital market response (on the example of WSE) to information provided by the issuers, in the form of a current report, regarding the impairment of assets in the conditions of the economic crisis. The author's research contribution to the state of knowledge in the field of the implemented paper is an attempt to verify how the market will react to such information in a situation when the specter of a serious economic crisis hangs over it, which was caused by a pandemic of COVID-19 during the 2020 year.

Finding references to the write-off by biggest companies listed on the WSE, 28 cases of write-off announcements were qualified to the final research sample. For each of them, a seven-day symmetrical event window was constructed, covering the day of publishing information about the impairment write-off and three days preceding and following that day. The obtained research results, verified with the non-parametric tests, indicated no statistical significance of the AAR for each of the analyzed days of the event window. Doubts may arise in particular from the lack of a significant difference from zero on the day of the impairment write-off announcement and on the next day, when in the previous study a market should most strongly discount the loss of achievable benefits from the assets involved. Hereby, the hypothesis adopted at the beginning of this study should be rejected. However, the lack of statistically significant abnormal returns on the days following the disclosure of information on impairment of assets allows to indicate a different market reaction in the conditions of the economic crisis caused by COVID-19 as compared to the one observed in previous years.

The tested results show no impact of the impairment of assets on the market valuation of

companies during the COVID-19 crisis year 2020. From a practical point of view, during the economic crisis, investors should not expect a significant decline in the market valuation of issuers announcing an impairment of assets. Thus, they lose some kind of investment opportunity (purchase of cheaper shares), which could have brought them above-average profits.

The author's discrepant results in relation to the previous publication in this field may result from the previous negative sentiment of investors towards risky assets, but also from small research sample.

For this reason, steps have been taken to undertake research to verify the behavior of share prices during the economic crisis condition of companies listed on the whole main trading floor of WSE. The results of the survey conducted on a group of all issuers listed on the WSE will allow more probability to indicate whether (or how) the market responds to information about the impairment of assets during the economic crisis caused by the COVID-19 pandemic. The abovementioned is an important perspective to develop for authors who study capital markets research in accounting.

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