

CAN STOCK MARKET FLUCTUATIONS BE PREDICTED? WIG.GAMES INDEX SECRET ON THE EXAMPLE OF CD PROJECT

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Abstract

Do the announcements of listed companies issued under ESPI have an impact on the increase or decrease of stock exchange quotes? Or maybe the visual aspect of the company's communication is more important? Can we talk about a specific „butterfly effect” when one screen before the game's premiere or an entry in social media is able to shake the facades of the gaming giant from Poland? The company CD Projekt was subject to the audit. The basic research thesis assumes that the announcement issued by a company as part of the legally established communication of listed companies has an impact on the company's quotation and capitalization on the market. The selected research method consists of two elements: statistical (quantitative) analysis and qualitative analysis. It is time to start the journey to the world of Cyberpunk 2077 and back.

Key words: WIG. Games, CD Projekt, GPW, ESPI, Media, marketing, visual communication

Introduction

„Cyberpunk 2077” is a role-playing game set in a bustling open world with open world technology, cyber-empowered street fighters, fierce net runners, and brilliant corpohackers. Players take on the role of V - a cyberpunk taking his first steps in the most dangerous city of the future. Story V and extensive side missions will offer dozens of hours of gameplay full of morally complicated choices. Their consequences will affect the future of V and the heroes he will meet on his way. The action of the game “Cyberpunk 2077” is set in the universe of the classic Cyberpunk 2020 story system.

To say that “Cyberpunk 2077” is just a game is to say nothing. This project, apart from the obvious interest of the gaming market, attracted the attention of investors from all over the world and even before its official premiere; it began to have a strong impact on pop culture on a global scale. The total budget of the entire project amounted to PLN 1.2 billion (about USD 315 million), of which 55% was spent on creating the game, and

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the remaining 45% of the budget was allocated to a marketing campaign - the largest campaign of this type in the history of the game developers. When it seemed that „Cyberpunk 2077” was doomed to success, problems suddenly began. CD Projekt company listed on the Warsaw Stock Exchange - the largest representative of the so-called WIG. Games index - it started to lose its value. It can be said that the share price of the largest Polish gaming company resembled a real roller-coaster. After temporary rebounds, within hours it started to fall well below the expectations of even the most sceptical investors. What were the reasons for these stock market fluctuations?

It is worth making the following research hypotheses at this point:

1. Were the fluctuations around CD Projekt and the game „Cyberpunk 2077” itself predictable?
2. Are the announcements of listed companies issued under ESPI to affect the rise or fall of the stock market?
3. Is the visual aspect of the company’s communication more important than the announcements of listed companies?
4. Can we talk about a kind of „butterfly effect” when one screen before the game’s premiere or an entry in social media is able to shake the facades of the gaming giant from Poland?

The basic research thesis assumes that the announcement issued by a company as part of the legally established communication of listed companies has an impact on the company’s quotation and capitalization on the market. The selected research method consists of two elements: statistical (quantitative) analysis and qualitative analysis. The main research objective is to check whether the announcements of listed companies issued under ESPI have an impact on the increase or decrease of stock exchange quotations. Hence, the aim is also to determine whether the communication may have an impact on the capitalization of a listed company. Along with the data analysis, it will be examined whether there are certain trends or characteristics characteristic of selected listed companies in the communication area in connection with changes in the value of stock quotes.

The choice of the topic is dictated by three reasons. First of all, the WIG. Games index started its publication on March 18, 2019, which means that it is a relatively young stock exchange index, and this carries small research coverage. This research paper naturally remedies this deficiency.

The second reason is the distinctive communication value of the companies that make up this index, game producers and companies in the general gaming sector are of particular communication interest from investors, players and other stakeholders.

The third justification for choosing this topic is the relatively low research coverage of general communication trends of companies listed on the Warsaw Stock Exchange.

Previous studies related to the impact of ESPI or EIB stock exchange announcements on the capitalization of companies have been subject to certain limitations. Part of the research focused solely on the foreign market or exposure to the world markets. This means that the surveys that linked company communication with stock quotes were subject to general trends. Often studies have shown that these trends are taking place, but that precise impact values have been lacking in individual indices or investment sectors. Attempts were also made to create potential research models, but with exposure to foreign markets, especially to the market of companies listed on the United States Stock Exchange - NYSE (New York Stock Exchange). In Polish research literature, there is a topic of the impact of messages and information related to the stock exchange on the capitalization of companies, however, these are often general rather than sector-specific studies. Due to the novelty of the WIG. Games index, the research coverage in this sector and the index is small. This creates the potential to develop a specific research model

that can be translated into a wider index or sector spectrum in the future.

Pandemic impact on changing consumer and investment behaviour

The coronavirus pandemic has caused a real earthquake in the financial world. It is not only about investor behaviour and the risk of experiencing the negative effects of the global economic crisis, but also about private portfolios. The problems could not be avoided in the markets, and the impact of the pandemic was felt on a global scale. Changes were also noted in terms of consumer and savings behaviour. Consumers had to adapt to the new conditions fairly quickly, which in turn significantly accelerated changes in purchasing habits and market behaviour. The drop in income related to, inter alia, with the suspension of the activity of a part of the economy, it often caused households cautiously to postpone certain expenses and pushed many people to look for various forms of savings. The CBOS study „Assessment of the financial situation of households” from the end of 2020 shows that 57% of Poles surveyed declare having any cash savings. At the same time, in the second half of 2020, this percentage decreased by 4 points. Percentage (data for the same period in 2021 are not yet available).

Consumer sentiment surveys carried out during the pandemic make it clear that a large percentage of Poles (even 40% of respondents) intend to limit their purchasing plans and minimize their spending. What are the consumers giving up? Usually these are sweets, snacks and ... clothing. At the same time, Poles declare a reduction in household budget expenses by 15-20%. Such a combination should not be surprising. It seems natural for consumers to decide first of all to give up those products, goods and services which, in their opinion, are not essential to their daily functioning and which they are able to do without. This explains the need to give up spending money on sweets and snacks. The clothing issue is also quite easy to explain. Savings in this area are due to considerable restrictions on mobility and meetings with friends and family. Many people found new clothes simply unnecessary during the pandemic. The issue of uncertainty related to the further development of the pandemic situation is of great importance here. Recent months, however, bring a bit more optimism. The cyclical public opinion poll conducted by UCE RESEARCH for the AdRetail Group and Hiper-Com Poland shows that in the second quarter of 2021, 40% of Poles plan to reduce their spending on purchases. On the other hand, in the first three months of this year, 44.8% of the respondents announced spending cuts. Undoubtedly, these swings in consumer sentiment are significantly influenced by the increasing percentage of vaccinated people and subsequent announcements and decisions regarding the easing of restrictions and pandemic restrictions.

Interestingly, the negative aspects of changes in consumer sentiment do not seem to have a significant impact on the gaming sector in Poland and around the world. The thesis may be justified, for example, by financial outlays for the production of computer games and marketing campaigns related to their promotion. An example may be the analysed company CD Projekt, which disclosed financial results for 2020. As it turns out, sales of „Cyberpunk 2077” released on December 10, 2020 amounted to over 13.7 million copies of the game by the end of the year.

Looking at the sales results alone, it could be assumed that it was a good result, but when we compare this data with the expectations of investors, the entire market or the players themselves, it turns out that sales at this level, taking into account the repeatedly postponed release date and the first critical reviews it turns out that this result is somewhat disappointing. Before the game's premiere, analysts agreed that „Cyberpunk 2077” is doomed to success, and the investment in CD Projekt is pure profit. Reality quickly verified these predictions. It is worth adding that there are many reasons for the difficult situation of „Cyberpunk 2077” on the computer games market (and right after its premiere). Several factors contributed to this sanity: the poor technical condition of the production, alleged by the reviewers (especially the console version), or the temporary

withdrawal of the PS4 edition from sale on the PlayStation Store.

Meanwhile, taking into account the entire visual campaign preceding the game's premiere, the creators managed to give the impression that the product, which was not available on the market at that time, has already become a hit and arouses interest all over the world.

The visual aspect of the company's communication. CD Projekt and strategy for the promotion of „Cyberpunk 2077” - case study

Long before the premiere, when „Cyberpunk 2077” functioned only as a mythical logo and a short trailer, billboards appeared in cities all over the world, and as part of the same outdoor campaign, even London's famous double-decker buses ran around the city in the colours of the game (Flipdabosss, 2020). The „Cyberpunk 2077” logotype and the characters known from the trailer quickly found various gadgets and so-called merchandising. T-shirts, sweatshirts and even shoes are available for sale. More and more brands were eagerly joining the promotional activities around the game. Let us take a closer look at the image campaign around the game. It can be argued that no other game in history has had such a great promotional campaign. There is no doubt that CD Projekt wanted to reach not only the target group - computer players - long before the premiere, but also achieve a gigantic commercial success and, through branding, ensure recognition of its new game practically all over the world. It cannot be denied that the target group of the „Cyberpunk 2077” marketing campaign is literally everyone, not just players.

By presenting the promotional activities plan, the game developers announced that the marketing machine will be launched on TV, radio, cinemas and print for at least four months. A large part of the activities was planned for the first half of November and was to coincide with the premiere of the game planned at that time - finally moved to December.

Piotr Nielubowicz, Vice President of the Management Board for Finance at CD Projekt, assured that Cyberpunk's marketing campaign will be by far the largest in the company's history. Observing its momentum, it is hard to disagree with him.

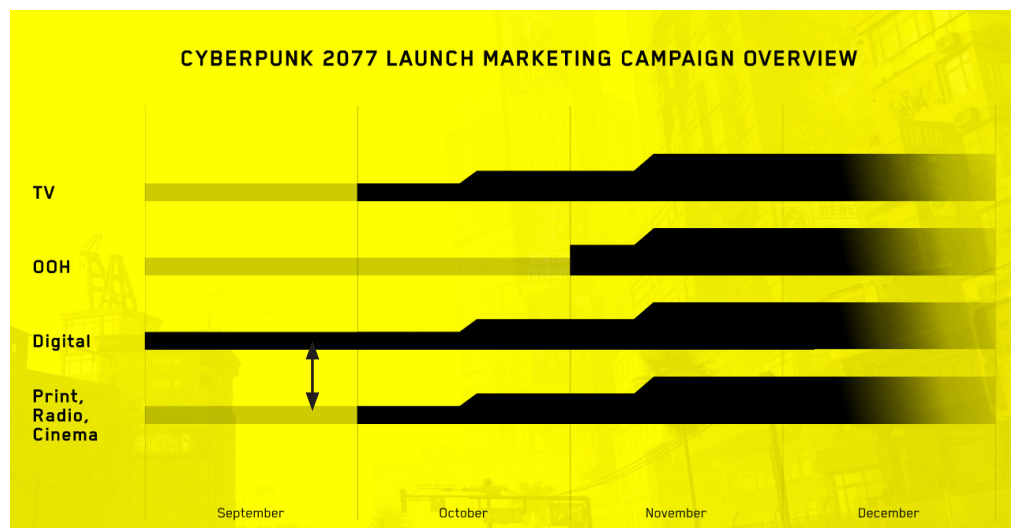


Figure 1. Cyberpunk 2077 Launch Marketing Campaign Overview

Source: Cyberpunk 2077 Launch Marketing Campaign Overview [Online image]. (2020). CD Projekt/Reddit. https://www.reddit.com/r/cyberpunkgame/comments/imkv1v/cp2077_marketing_campaign/

You can clearly see the scale of the cyberpunk campaign when we analyse how it

was conducted and through which channels it reached the potential recipients. It should be pointed out right away that the Polish game was promoted in all possible channels, in almost all possible ways.

„Cyberpunk 2077” was announced in 2013, when the first trailer of the game appeared. The actual campaign began in 2019, during the E3 fair in Los Angeles (the largest gaming fair). Promotion specialists focused on drawing attention to the new game in a rather unconventional way. During the presentation of the game, Keanu Reeves - an actor associated with such blockbusters as „The Matrix” or „John Wick”, entered the stage. It was announced that his image would appear in the game as one of the main characters of Johnny Silverhand (Game Clips And Tips, 2019).

It is obvious that „Cyberpunk 2077” main advertising channels are television, cinema and the Internet. „Cyberpunk 2077” is present on screens - large and small ones. During the E3 trade fair, CD PROJEKT presented a trailer dedicated to cinemas (GameSpot Trailers, 2019).

The first TV commercial for Cyberpunk 2077 made its debut during the NBA finals (Geoffkeighley, 2020). We did not have to wait long for TV commercials as well.

It was quite obvious that such a product would be quite widely advertised on the Internet. The game has its profiles on social media, including Facebook, Twitter or Instagram. A lot of material has been made available on the official YouTube channel of the game (CyberPunkGame, 2020). This is where a lot of behind-the-scenes information about the game appeared. Today, there is no need to convince anyone that social media is a powerful promotional tool. This is where users literally have everything at their fingertips, accessible with just a few clicks (Łuczuk, 2017, p.116-120). An additional advantage is the ability to collect statistics and personalize and target the entire campaign depending on a specific target group. Why, then, did the creators of the game „Cyberpunk 2077” not only bet on this advertising format, but literally flood the market with ads in various formats?

The answer is quite simple. From the very beginning, the creators of the game did not only care about reaching the gaming community. „Cyberpunk 2077” was also to appear in public space. Large outdoor advertising, eye-catching with the yellow colour characteristic of the entire campaign could be admired on the main streets and exit routes from large metropolises. The ads for the game are on buses and at bus stops. And not only in Polish cities, but also, for example, in London or New York. „Cyberpunk 2077” (Wańtuchowicz, 2020) and on Piccadilly Circus (KreatorKontentu, 2020).

It is worth adding that „Cyberpunk 2077” was also advertised in less obvious ways, although resulting naturally from the nature of the game. First, there is an interesting idea for a series of clothes directly related to the game. You could find them, among others in the CD Projekt e-store and LPP brand stores: Reserved or Sinsay. Outside Europe, Adidas shoes with the „Cyberpunk 2077” logo were also available.

But that is not all. Even Old Spice cosmetics and carbonated drinks with the game logo and related advertisements have appeared on the market. The producer of Rockstar Energy Drink and Sprite decided to take such a step, which could be purchased in commemorative cans related to the game. Other unusual items related to the game „Cyberpunk 2077” have also appeared on sale. It is worth mentioning here the GeForce RTX 2080 Ti Cyberpunk 2077 Edition graphics card, which was sold for... 25 000 PLN, and in the official CD Projekt e-shop you could buy the puzzle „Good Loot Puzzle Cyberpunk 2077 - Junkyard” for PLN 89.

Of course, special collector’s versions of the game are also available for sale. For example, „PS4 Cyberpunk 2077 / Collector’s Edition” was priced at PLN 1599 (Perfectblue.pl, 2020). The composition of the kit, which can be purchased for this money, can make you feel dizzy. The set includes:

- Collector’s Edition Box

- A CD with an audio track
- Collector's SteelBook
- A 25-centimeter figure depicting the main character of the game
- Hardcover artbook
- Metal pins
- Metal Quadra V-tech keychain
- NCPD evidence including an annotated guide to Night City
- Embroidered patches
- A compendium of knowledge with information about the game world
- Postcards from Night City
- Map of Night City
- Stickers for sticker bombs
- Digital extras:
- Original game music
- A mini art book with selected graphics from the game
- Cyberpunk 2020 Handbook
- Wallpapers for computers and mobile devices
- Cyberpunk 2077 Digital Comic: Your Voice

The total budget of „Cyberpunk 2077” amounted to PLN 1.2 billion (about USD 315 million), which is a huge amount, especially compared to the „The Witcher 3” released in 2015, whose production and marketing campaign consumed PLN 306 million (PLN 81 million). It is by far the most expensive game created in Poland, but it gives way to, inter alia, „Star Citizen” (at least \$ 355 million and growing) and „RDR 2” (\$ 370-540 million). How was the amount in Cyberpunk 2077 distributed? Usually in the case of AAA games, more money is spent on promotion than the production process, but it turned out that CD Projekt spent more money on game development than on the marketing campaign. The budget for the production of Cyberpunk 2077 was PLN 567 million (about \$ 149 million), and together with the overheads (additional costs related to legal departments, production and business development and the game premiere in general, but not as part of marketing), it amounted to PLN 660 million (55 % of the total).

This means that 45% of the PLN 1.2 billion was spent on the „Cyberpunk 2077” promotional campaign (PLN 540 million, or about USD 142 million), which is less than just creating the game. However, these are not drastic differences. In comparison, the production costs of „The Witcher 3” amounted to about PLN 129 million (\$ 34 million), which is slightly over 42% of the total budget.

It should be remembered that the promotion of AAA games („Cyberpunk 20177” belongs to this segment) does not end on the title's release date. Such a broad visual campaign of the game has additional benefits for CD Projekt. With a sufficiently large commercial success of the title, the company may begin to profit from royalties for using the image of the game. This is evidence that justifies the thesis according to which CD Projekt, when planning the entire promotional campaign, intended from the very beginning to go beyond the strict circle of players with its latest product. „Cyberpunk 2077” was supposed to hit even those places where such games had not been played so far. Long before the game's premiere, it was clear that Cyberpunk 2077 must not only be a good game, it must be a giant hit - also in a commercial context. Anticipating the sales results, analysts argued that in order to meet these expectations, CD Projekt should sell 30.4 million copies of the game within 12 months of the premiere. Today we know that these assumptions have not been achieved.

Interestingly, the players who bought „Cyberpunk 2077” do not seem to share the sentiment of investors and reviewers. According to the latest statistics, the returns of the game are at the level of 1.6% of copies, so it is a fairly small factor.

In the first half of 2021, CD Projekt focused on improving the gameplay of „Cyberpunk 2077”. In 2021, the game received seven updates and returned to PlayStation Store in June. In the first half of 2021, the CD Projekt Group generated PLN 471 million in revenues, mainly due to the sale of the games „Cyberpunk 2077” and „The Witcher 3: Wild Hunt”. The consolidated net profit in the discussed period amounted to PLN 105 million (CD PROJEKT, 2021).

It should be noted that, according to the information from Dom Maklerski Banku Ochrony Środowiska, within a few months CD Projekt, the most beloved studio in the world, has become the most hated. Among the indicated problems of the development studio are errors of the console version of „Cyberpunk 2077” and problems with communication. It is already estimated that it will take the company many years to regain the players’ trust.

It should be noted, however, that despite many bitter words about CD Projekt and „Cyberpunk 2077”, good weeks are also forecast for the developers of the game. It turns out that players are looking more and more favourably at CD Projekt thanks to the corrections and the version of Cyberpunk 2077 for PlayStation 5 and Xbox Series X | S.

However, this does not change the fact that the sales forecast has been reduced to 15.5 million units in 2020 and to 20 million units within the year from the premiere. Analysts also lowered the forecasts for CD Projekt’s results - from the initial PLN 1.175 billion to PLN 633 million (Bankier.pl, 2021).

Sales volume forecasts for 2020-24 decreased by 31 percent. up to 49 million units (previously 71.1 million units). There is of course only one reaction to analysts’ forecasts - big drops in the stock market. Was it possible to predict them in some way?

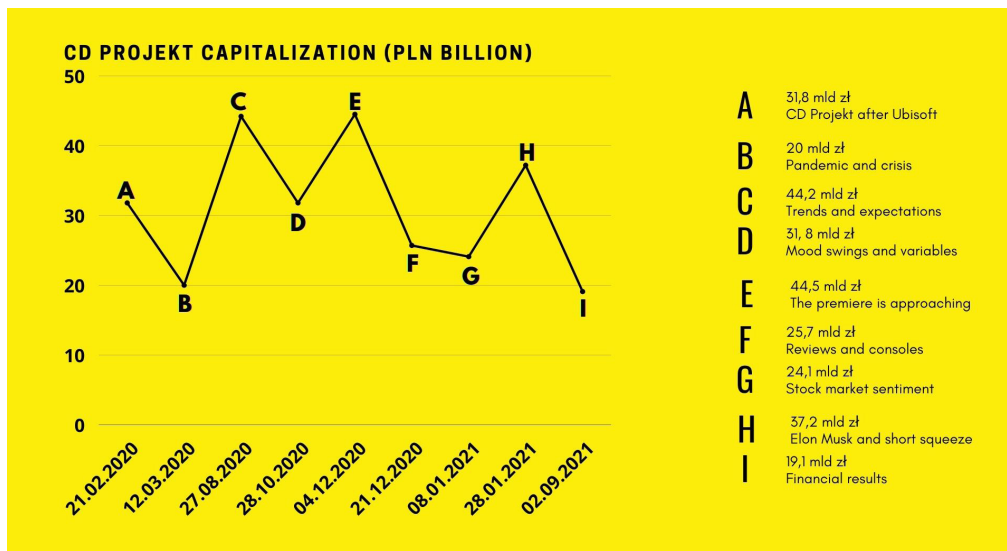


Figure 2. How has the capitalization of CD Projekt changed?
Source: Maj, S. (2021). CD Projekt capitalization. Own research.

New sources of information

Although the capital market operates on the same supply and demand principles despite the passage of years, the information environment has changed extremely rapidly and clearly. This is evidenced by investor behaviour, stock market volatility, new re-

search and publications, but also by statistics on the ever-increasing volume of data we produce. As it results from the statistics „Volume of data/information created, captured, copied, and consumed worldwide from 2010 to 2025” in this year, according to forecasts, we will produce 79 zettabytes of digital data, in 2022 it will be 97 zettabytes, and in 2023 - 120 zettabytes (Statista, 2022). And it should be kept in mind that with events generating additional digital data supply, these numbers could be even higher. Arne Holst mentions: „Over the next five years up to 2025, global data creation is projected to grow to more than 180 zettabytes. In 2020, the amount of data created and replicated reached a new high. The growth was higher than previously expected caused by the increased demand due to the COVID-19 pandemic, as more people worked and learned from home and used home entertainment options more often” (Statista, 2022). The information about the overproduction of data and the awareness of the growing supply of data make the capital market participant, regardless of whether he is an investor, researcher or passive observer, realize that his decisions are influenced not only by the scope of known and available information, but also by intangible elements which, due to their complexity or subtlety, are extremely difficult to interpret in investment models. On the other hand, it should be remembered that an additional difficulty in the analysis of information is the cognitive capacity of the market participant. Naturally, not everybody is conditioned to fully grasp statistical values, and consequently, it cannot be assumed that every market participant is equally well prepared to receive information (Kalinowski & Krzykowski, 2012, p. 169-177). It means that the company as well as researchers or investors in capital markets are surrounded by the whole cross-section of information that is created by many parties - journalists, investors on internet forums, media and investor agencies, algorithms or bots (Rostek & Młodzianowski, 2017). Taking into account the pace of growing data packets, it can be said that we are the observers of information explosion, which naturally has positive effects, which include cheaper and easier access to information or faster transfer of data, but this phenomenon generates a variable in the form of a relatively high complexity of issues and data when making investment decisions and creating research models on the capital market (Hilbert, 2012). Moreover, this means that the outcome of the research model can be directly or indirectly affected by information saturation, as there is often a point at which it is impossible to determine whether the information package under study is a complete set of data or a residual and incomplete one. What is important, however, is that even with incomplete knowledge; it is possible to make theses that have real practical application in the capital market in the form of predicting further developments related to the company. Researchers note that social media sentiment strongly predicts daily returns (Fraiberger et al., 2018) in developed and emerging markets. The analysis of social media in the context of stock market investments can also be found in Polish economic think tanks such as PIE (Polish Economic Institute). Moreover, examples of social media analysis in the context of stock market investments can also be found in Polish economic think tanks such as PIE (Polish Economic Institute). Researchers, in one of their reports, presented a study in which they noted that the use of social media data allows for a really satisfactory mapping of the financial and investment wines of companies. As the researchers state in the report: „An algorithmic system for evaluating the quantitative and qualitative characteristics of an issuer of capital market instruments - as an alternative rating method - makes it possible to effectively predict the future behaviour of stock prices and rates of return. And the use of readily available data - e.g. from Facebook - also makes it possible to rate unlisted entities.” (Batorski, et al., 2020). In the context of international research, it is worth citing again the research in a 2018 article titled. „Media Sentiment and International Asset Prices.” The researchers also showed that the impact of social media on stock prices in daily volatility does occur and is noticeable. Importantly, for this research, 4.5 million articles published by Reuters between 1991 and 2015 were analysed. For example, the researchers noted that local investor optimism attracts capital for a few days, while global optimism favours placing funds in an area permanently. According to

the researchers, this relationship was due in part to foreign investor sentiment, and this again suggests that market reactions are far more complex than they may appear. It is still important to remember that the capital market remains something of a mystery in which, despite fixed rules, participants are dealt new and new cards that do not change the rules of the game but do change the market dynamics. This was also the case with the development of information and the generation of more and more contexts in the stock markets by the rapid transmission of information. Information overload today is rarely handled by humans, but even algorithms have trouble sorting through the data and arriving at the complex patterns that describe the investment market. A study conducted by Refinitiv during the COVID-19 pandemic can serve as an example. The results showed that investing with quantitative methods using machine learning and quant solutions for 72 percent of investors was a problem; another 12 percent found their models outdated, and 15 percent were building new models. According to Amanda West, head of Refinitiv Labs at Refinitiv, the problem for quant models was the huge market dynamics that began during the March 2020 stock market crash. These examples vividly demonstrate that predicting how a listed company's stock price will behave is a difficult task, but not impossible. It should be remembered, however, that in creating any research model in such a volatile market, an unavoidable element is a significant risk of errors and ambiguity in conclusions.



Figure 3. CD Projekt share price – period of 3 years

Source: Maj, S. (2021). CD Projekt share price – period of 3 years. Own research/Stooq.

Research model - CD Projekt

A fascinating media, social and economic phenomenon was the anticipation of the release of *Cyberpunk 2077*, a game developed by the company CD Projekt. This company is one of the important and well-known game producers, and in terms of capitalization size in May 2020, it even surpassed Ubisoft. This made the Polish game developer the most valuable listed game developer in Europe. The company, through its increased dynamics in the market, was a very difficult element to analyse. However, the authors of this article have attempted to create a preliminary model for analysing ESPI messages on the capitalization of a company listed on the Warsaw Stock Exchange. The choice of ESPI messages results from the fact that it is one of the most important sources of information on current events in the company. The research method was based on the author's design and market observations. The elements of this method consist of analyses of three areas: a) The selected ESPI announcement - i.e. the announcement issued by the company as part of its information obligations; b) The closing price - i.e. the share price at which the last transaction on the company's shares was concluded;

c) The daily trading volume - i.e. the total number of shares of a given company that changed hands during a single day. The research thesis adopted in this model assumed that the ESPI announcement issued by a company affects the share price and hence investor activity in a given session. Depending on the time of publication of an ESPI message by a company, the impact of the message was assigned to a specific day in the trading session. The trading session on the Warsaw Stock Exchange lasts from 9 a.m. to 5 p.m. on business days. Therefore, an announcement that is published on a business day but after 5 p.m. will be assigned to the next possible trading session. In the case of an announcement published on a day off from the trading session, the impact of the announcement on the company's share price was analysed in relation to the nearest possible trading session. It should be noted that not every announcement was taken into account. Announcements which were partial information, such as reports on the company's buyback of its own shares in CD Projekt, were combined into a single segment of the start and end of the buyback of own shares. Such an action was aimed at limiting the information chaos resulting sometimes from a large number of announcements issued by companies. Another element that was included in the research model is the trading volume of shares of a given company. The daily trading volume from the day associated with the ESPI announcement was compared with the average trading volume: from 40 days, from 20 days and from 10 trading days. The use of such averages is intended to reduce the discrepancies associated with strong market trends and volatility in company stock prices during the period under study. From the research point of view, the trading volume analysis has a special value, because it allows showing the numerical interest of investors in a given listed company. And as it results from practice in case of technical analysis, the trading volume is a frequent element of investment strategies (Murphy, 1999), which additionally strengthens the conviction, that clear statistical changes in the company's shares turnover will be a sign that the message had an impact on investors' behaviour. In the case of the company under analysis, it is difficult to define a reasonable level of „high” and „low” volume. However, we can assume, following the classic literature on technical analysis, that „high volume” in any market is at least 25% higher than the average of the last two weeks, while „low volume” is at least 25% lower than the average of the corresponding period (Elder, 2014). Therefore, if in the data presented further on the trading volume on the day referring to the ESPI announcement is at least 25% higher than the two-week average, it can be assumed that the announcement clearly attracted the interest of investors. The third element used in the research model is the closing price of the analysed company on a given day. In this case, the averages of: 40 days, from 20 days and from 10 trading days. The purpose of this distinction is the same as in the case of the trading volume, where by using different averages in the model the risk of error resulting from rising share prices or sudden plunges on the global stock market, which occurred for example in March 2020, was reduced. By applying all of the above elements, the author's research model was created, which made it possible to determine: a) changes in the company's share price and the resulting deviation from the average; b) changes in volume, which confirm rising or falling interest in the company on the trading day to which the issued ESPI announcement refers; c) the relationship between the type of announcement and changes in the market. From the perspective of the research model, it is important to note that the ESPI announcement itself is only a partial element affecting investors' investment decisions, so it will be reasonable to assume that the model created cannot be complete. According to researchers, this model can be complemented by additional determination of company sentiment. On the Polish market, there have already been studies on sentiment - which was cited in the text, but you can also find start-ups that deal with forecasting and determining the prospects for the development of the company - the Polish solution is a platform Forc.ee, created by experts from the VC market.

Analysis - CD Projekt

The study of CD Projekt began on June 1, 2019 and continued until March 1, 2021. The choice of this study period was chosen due to the study's broad exposure to market events. During the mentioned period, investors observed: anticipation of CD Projekt's latest release, „Cyberpunk 2077“, the period was also associated with excessive randomness and volatility in the markets, which was triggered by the 2020 COVID-19 pandemic. Moreover, the period under study also combines the postponement of the release of the Warsaw studio's highly anticipated game several times, the subsequent rising expectations, the final disappointment of the market, as shown by the reviews, and ultimately the share price declines, which took the market by surprise. The complexity of the phenomena which accompanied the development of CD Projekt's share price suggest that analysing the results of the survey in isolation from the company's share price would be incorrect. Therefore, when analysing the data, one should look at the company's share price, which was extremely volatile in individual periods. The volatility of the averages reaches hundreds of percent at times. A total of 40 ESPI releases issued by CD Projekt were analysed in the study. The study begins with the disclosure of confidential information about the release of „Cyberpunk 2077“ and ends with the change in the date of publication of periodic reports by the company. In the selection of the messages, some repetitive elements that did not bring significant elements from the point of view of the study were omitted. The nature of the data allows for very complex conclusions. It is therefore suggested that when looking at the data more broadly, one should consider whether, when looking at a message, the researcher or investor using the model is trying to assign a spurious connection to the message, which is related to a well-known cognitive error - the confirmation effect. The analysis of the company data allows us to conclude that the original thesis of the study about the influence of the message on the decisions of stock investors is true. Moreover, investors are subject to the habit of bad information at certain moments, an example of which in the case of CD Projekt is the violent and volume-confirmed reaction to the first information about the postponement of the release of „Cyberpunk 2077“ from January 16, 2020. At that time, on the trading day potentially affected by the ESPI announcement, the trading volume increased by 1037 percent compared to the 10-day trading average on volume, the decrease of shares in the corresponding average was 17.65 percent. However, the second announcement on June 18, 2020 about the postponement of the release brought a smaller increase in trading volume of 159 percent and a smaller decrease in the value of shares, where compared to the 10-day average was 7.65 percent. The third announcement on October 27, 2020, about the postponement of the release of the game brought a decrease in shares of 23.13 percent, with an increase of 196 percent in trading volume compared to the average. The data show that investors reacted relatively more calmly in the area of share trading volume with subsequent postponements, but on the other hand, the declines with the third postponement were pronounced on the share price. In the case of the analysed announcements, only 4 out of 40 were such a significant buy signal that they prompted investors to generate an increase in the share price with respect to the value from the 10-day average, in the case of comparison to the 20-day average 23 announcements encouraged investors to follow an upward trend, and in the case of comparison to the 40-day average 21 announcements triggered an increase in the share price. In terms of trading volume, comparing the announcements to the 10-day and 20-day averages shows convergent findings that 22 announcements out of 40 generated increased investor interest, this means that volume can be a relatively effective method of predicting company interest in relation to announcements. On the other hand, comparing the turnover to the 40-day average does not generate an excessive deviation from the above statistics, as 23 announcements generated increased turnover relative to the average. The significant impact on investor reaction was sometimes driven by news that may have been further fuelled by emotional understatement is puzzling. Such was the

case with the announcement of the suspension of „Cyberpunk 2077” availability on PlayStation Store, when frequent reports and speculations suggested that the game might be withdrawn from other sales platforms. It is worth remembering, by the way, that the reaction of investors - a drop in price by more than 30 percent against the 40-day average - was covered by the trading volume.

Summary

The main research thesis turned out to be correct - stock exchange announcements influence the decisions of investors, and thus the capitalization of companies. Drawing unequivocal results from some messages and events turned out to be problematic in a positive sense.

However, original research guesses suggested that it would be possible to notice repetitive patterns, for example in the case of the publication of periodic reports on financial results. The study found that there is, however, an exceptionally noticeable variation in reports and messages. Moreover, some announcements suggested that they could move the market and increase or decrease the company's capitalization, but the data quickly refuted this thesis. Repeatedly, the conclusions from the research model suggested that only really important and unique messages, such as: postponing the game's premiere, may suggest rapid changes in the market. Another conclusion that appeared along with the analysis is the fact that many information elements take place outside of messages, in the market background, in social media. Really, it is possible to reach the conclusion that it is almost impossible to fully cover a company in the information space. It will be idealistic to suppose that even using expert support will reduce research errors. It turns out that experts who operate on assumptions and the finite data set - developed in time until a recommendation or analysis is issued, are also subject to limitations. An example of such an event will be the fact that none of the analysts predicted such huge errors at the premiere of „Cyberpunk 2077”, which resulted in poor player reviews and problems with the company's image.

Undoubtedly, however, it must be admitted once again, that the complexity of financial markets, and in particular of a small segment of stock exchange investments, generates huge layers of secrecy. Most of the events are still uncountable, and the obtained research models are subject to their own variability. Using quantitative methods without applying qualitative methods is a road to nowhere. This gives rise to new interpretative possibilities in economic sciences, if we notice that the message itself generates such a huge variation in decisions, and then we can rightly conclude that the full market is humanly impossible to undertake.

References:

Archiwum Centrum wyników - CD PROJEKT [Results Center Archive - CD PROJEKT]. CD PROJEKT. Retrieved 11 October 2021, from <https://www.cdprojekt.com/pl/inwestorzy/centrum-wynikow/>

BATORSKI, D., BARANOWSKI, M., BŁAWAT, B., KRAWIEC, J., MŁODOŻENIEC, M., & TALAREK, P. (2020). *Zwroty z akcji a sentyment w mediach społecznościowych [Twists and sentiment on social media]*. Warsaw: Polish Institute of Economics.

Cyberpunk 2077 - Official Cinematic Trailer ft. Keanu Reeves | E3 2019. *youtube.com*. (2019). Retrieved 11 October 2021, from <https://youtu.be/YApuEWtG30w>

Cyberpunk 2077 Keanu Reeves at E3 2019 Xbox Conference. *Youtube.com*. (2019). Retrieved 11 October 2021, from <https://www.youtube.com/watch?v=VWGUCoBpyLk>

Cyberpunk 2077, *Youtube.com*. Retrieved 11 October 2021, from <https://www.youtube.com/user/CyberPunk-Game>

DM BOŚ obniżył wycenę akcji CD Projektu [DM BOŚ lowered the valuation of CD Projekt's shares]. *Bankier.pl*. (2021). Retrieved 11 October 2021, from <https://www.bankier.pl/wiadomosc/DM-BOS-obnizyl-wycene-akcji-CD->

Projektu-do-142-zl-8114841.html

ELDER, A. (2014). *The New Trading for a Living*. Hoboken, New Jersey: Wiley John + Sons.

Flip da boss [@flipdabosss]. (2020, December 5). I went to central London today and I saw a Cyberpunk bus drive by I didn't get the time to take a pic but it looks sick so here's a pic from google [Tweet]. *Twitter*. <https://twitter.com/Flipdabosss/status/1335300482152198152>

FRAIBERGER, S., LEE, D., PUY, D., & RANCIERE, R. (2018). Media Sentiment and International Asset Prices. *IMF Working Papers*, 18(274), 1. <https://doi.org/10.5089/9781484389218.001>

GOŁĘBIEWSKI, R. [@KreatorKontentu]. (2020, November 11). Saw this during my walk :D Czekamy niecierpliwie #cyberpunk2077 #cyberpunk #warszawa [Tweet]. *Twitter*. <https://twitter.com/KreatorKontentu/status/1326586963131043840>

Gra PS4 Cyberpunk 2077 Edycja Kolekcjonerska - Sklep Perfect Blue. PerfectBlue - Gry / Konsole. PS4, Switch, Xbox, gadżety [PS4 Cyberpunk 2077 Collector's Edition - Perfect Blue Store. PerfectBlue - Games / Consoles. PS4, Switch, Xbox, gadgets]. Retrieved 11 October 2021, from https://perfectblue.pl/produkt/gr-ps4-cyberpunk-2077-edycja-kolekcjonerska/?utm_source=skapiec.pl&utm_medium=referral

HILBERT, M. (2012). How much information is there in the "information society"?. *Significance*, 9(4), 8-12. <https://doi.org/10.1111/j.1740-9713.2012.00584.x>

KALINOWSKI, M., & KRZYKOWSKI, G. (2012). Racjonalność decyzji inwestycyjnych inwestorów indywidualnych na polskim rynku akcji [Rationality of investment decisions of individual investors on the Polish stock market]. *Problemy Zarządzania*, 10(4), 169-177. <https://doi.org/10.7172/1644-9584.39.10>

KEIGHLEY, G. (2022). Cyberpunk 2077 ad with Keanu Reeves that just showed in the NBA Finals Game 1. *Twitter*. Retrieved 11 October 2021, from <https://twitter.com/geoffkeighley/status/1311509820147548160>

ŁUCZUK, P. (2017). *Cyberwojna. Wojna bez amunicji? [Cyberwar. A war without ammunition?]* Kraków: Biały Kruk.

MURPHY, J. (1999). *Technical Analysis of the Financial Markets: A Comprehensive Guide to Trading Methods and Applications*. Prentice Hall Press.

ROSTEK, K., & MŁODZIANOWSKI, D. (2017). Współzależność informacji sieciowych oraz zmian indeksów zachodzących na Giełdzie Papierów Wartościowych w Warszawie [Interdependence of network information and changes in indices occurring on the Warsaw Stock Exchange]. *Zeszyty Naukowe Uniwersytetu Przyrodniczo-Humanistycznego W Siedlcach. Administracja I Zarządzanie*, 42(115), 249-263. <https://doi.org/11331/1895>

Total data volume worldwide 2010-2025 | Statista. Statista. (2022). Retrieved 11 October 2021, from <https://www.statista.com/statistics/871513/worldwide-data-created/>

WAŃTUCHOWICZ, P. (2020). Reklama Cyberpunk 2077 na Times Square. CD Projekt Red zapłacił miliony dolarów? [Cyberpunk 2077 ad in Times Square. CD Projekt Red paid millions of dollars?]. *Eurogamer.pl*. Retrieved 11 October 2021, from <https://www.eurogamer.pl/articles/2020-11-09-reklama-cyberpunk-2077-na-times-square-cd-projekt-red-zapacil-miliony-dolarow>