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INFORMATION AS A FACTOR REGULATING AND DEREGULATING MARKETS. A CASE STUDY OF THE DOT.COM CRISIS, THE LEHMAN BROTHERS CRISIS AND THE SARS-COV2 PANDEMIC

Abstract. Present, as Manuel Castells (1996) notes, we live in the information age. Knowledge and the way it is acquired and processed are the driving forces of the economy, and information processing systems are the strength of economies. The aim of this article is to identify the key role of the information supply phenomenon in contemporary socio-economic processes. The initial part of the article will define such concepts as: information, infodemia, information market, in the further part examples of the use of information in the process of forming social behaviour in the market context will be presented. For this purpose, three major economic crises from the turn of the 20th and 21st century will be used cross-sectionally. The first will be described as the dot-com crisis, i.e. the first global Internet players, which led to the collapse or loss of value of many global Internet platforms through the creation and bursting of a speculative bubble. The second crisis described below was related to the collapse of Lehman Brothers, a leading US bank, and the US housing crisis. In the above case, both supply and concealment of information in the public sphere could be observed. The last crisis described is the crisis related to the SARS-COV2 pandemic, in which dis- and mis- information activities proved to be crucial.

Keywords: infodemia, crisis, market, virtual economy, e-economy.

1. Historical and definitional introduction

The massive development of communication technologies and their social adaptation has modified both the social rituals and economic behaviour of modern humans. Widespread access to information has both

accelerated market processes and changed the characteristics of human economic behaviour (2006). The development of the Internet has influenced the emergence of new phenomena such as the digital economy, e-commerce and has changed previous purchasing models by introducing, for example, the ROPO model (research offline, buy online). Information as a factor, not as an element, has become the basis of all activity. Ways of acquiring, processing and distributing information have become key skills in the modern economic game. The very concept of information is variously defined in the specialist literature. R. B. Ash (1965) defined information as an element of a communication system. Such a view can be called a systems view. Information is one element of a larger whole and only the interconnection of the individual elements will enable a creation in a functional context. Another definitional perspective is presented by the authors of the so-called semantic theory of information, who consider information to be a set of messages about facts, events, characteristics of objects, etc., captured and presented as such. Another definition perspective is presented by the authors of the so-called semantic theory of information, who believe that information is a set of messages about facts, events, characteristics of objects, etc., formulated and provided in such a form that it allows the recipient (human or machine) to respond to the situation and undertake appropriate activity (Stefanowicz 1987). Some researchers in the systemic stream propose a dichotomous model of information: narrow information and broad information. In the broad view, information is not only a message, but also any decision, prohibition, suggestion or command. It can be transmitted in the human-to-human system, but also in other systems in which the functions of sender and receiver can be performed by living beings, machines or objects. In a narrow sense, information refers to a message obtained by humans through observation or reflection (Czekaj 2012: 17). The phenomenon of information inflation in social space has been defined as information oversupply (Eppler, Mennings 2004: 326), information overload (Babik 2010) or, in the extreme case, infodemia (WHO), i.e. a state of permanent information overload, in which true and false information is mixed. The term infodemia first appeared during the SARS-COV2 pandemic and was defined as the sudden appearance of information on health issues. It is a condition in which individuals or social groups with technical capabilities and some above-average need for information are exposed to a huge oversupply of information causing a lack of rationality in action. In a networked environment, this can lead to a situation of dominance or equivalence of true and false information and their erroneous

connotation and deconnotation. An additional distinguishing element of infodemia is the emergence of a mechanism for the transmission of information through unofficial channels using media and social messaging. In the process of understanding the influence of information on the economic and social decisions of individuals and social groups, it is also important to recall the rule of inaccessibility, one of the psychomanipulation techniques consisting in giving a nimbus of uniqueness or temporality to information, in order to build interest in the individual in the information. This action has often been used in the situations described in this article to trigger some social action, such as during the dot.com crisis to perpetuate positive investment trends and buyer attitudes towards highly and misleadingly valued companies. An interesting concept of the use of information as an economic good was proposed by Pawel Dziekański, who pointed out that "(r)evelopment of the global information society means that information is treated as an economic good, a basic resource and a fundamental economic category". He also pointed out that today we are facing a transformation in the organisation of the world economy resulting from correlative processes: "1) the technological revolution, based mainly on information technologies, 2) the formation of the global economy, 3) the change of the development paradigm, consisting in the transition from an industrial economy to an information economy, a knowledgebased economy." (Dziekański 2012: 337). As D. Materska (2005) points out, the production of information (information goods) is expensive, but its reproduction costs little. Thus, nowadays the dominant problem is becoming a flood of information rather than access to it. In economic processes, we are also dealing with the phenomena of timeliness, completeness, assimilability, readability and reliability of information and the emergence of information asymmetry, which is defined as a situation in which one party to a transaction has more information about the conditions and circumstances of that transaction than the other party (Dziekański 2012: 390). The primacy of information as an economic good in the modern world has led to the emergence of a new type of economy – the information economy. This type of economy, proposed by Mark Porat, is characterised by an increased emphasis on information activities and the information industry, in which information is valued as a capital good (Riffkin 2000). Manuel Castells points out that the information economy is regarded as a 'stage' or 'phase' of the economy, following the stages of hunting, agriculture and production. Such a conceptualisation is widely observed in relation to the information society, which is a related concept (Castells 1996).

2. The dot.com crisis and the impact of information on investor decisions

The term dot.coms refers to companies (e.g. Google, Amazon, Ebay, Aol.com) established in the early phase of the Internet's development (1995–2001) that have monetised their expertise thanks to the popularisation of the Internet. A characteristic feature of these companies is that they derive most of their income from selling services or products in the virtual space. The etymology of the name derives from the domain ".com" (English: dot com) originally intended for the commercial use of the World Wide Web.

The period of pioneering popularisation of Internet services began in 1995, in which Windows 95 was created along with the Internet Explorer browser, but the phenomenon of *start-tech* funding[1] has its roots several years earlier. The transition of the internet from the military-academic phase to the phase of mass popularisation had already begun in the late 1980s and early 1990s. In 1995, the number of Internet users stood at 18 million, and analysts correctly estimated a leap in this number in the following years. As a result, investment funds and individual investors turned their attention to this industry, counting on the high returns associated with a low-saturation and forward-looking investment market. In addition, media companies encouraged people to invest in risky technology stocks by presenting overly optimistic expectations of future returns and a 'get rich quick' mantra. Business publications such as The Wall Street Journal, Forbes, Bloomberg and many investment analysis publications stimulated investment demand. As David Shedden points out, "(Alan Greenspan's) speech on 'irrational exuberance' in December 1996 also gave impetus to technological growth and the bubble" (Shedden 2015). The speech has been recorded as one of Greenspan's so-called "excuses". The then Fed chief often prompted investors to take risks, which he then warned them against. In 1996, he made a famous statement about irrational exuberance, warning that the market had become too volatile. He then changed course and, with the authority of his office, supported the thesis that, in the end, this exuberance did not turn out to be so irrational (Forbes 2009). Such information from the market regulator also influenced inappropriate investor decisions. The favourable information climate supported the low interest rate environment of 1998–1999 in the US. This combination of factors caused investors to seek out new opportunities to multiply their capital. The relative newness of internet technology helped entrepreneurs to easily raise funds for 'promising' ideas, even without having a realistic busi-

ness plan. It was not uncommon for the funds provided by venture capital funds to be wasted and to fail to produce tangible results, an example being Lendido.com, which was intended to be used for user-to-user lending of various types of white and brown goods and tools, in which investors invested more than $48 million, but which did not get beyond the design and investor presentation phase. Some researchers of the phenomenon such as Thung Pang point to a certain characteristic of the market's response to the new technology. In his essay, Pang pointed out parallels between the dot.com crisis and the spread of railways (1840s), the introduction of radio (1920s) or the development of personal computer design (1980s).

At each of these historical moments, stock exchanges witnessed an increase in investment interest in the shares of companies whose activities were related to the technical innovation in question. The above factors led to an unwarranted investment boom, which, among other things, manifested itself in the fact that companies listed on the NASDAQ rose from 781 points in 1995 to more than 5,000 points in 2000, as presented in Chart 1.

Chart 1

Growth in value of NASDAQ internet companies 1994–2004



Source: NASDAQ Composite

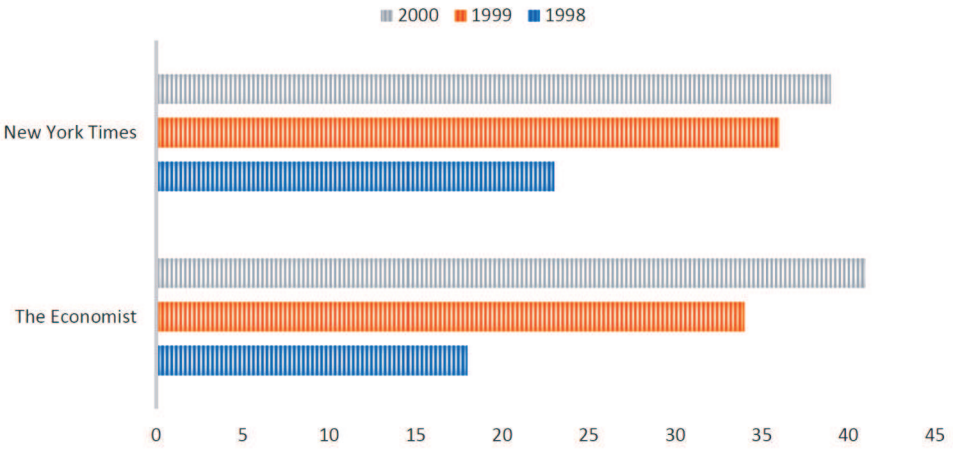
The Internet bubble described above reached its peak on 10 March 2000, when the NASDAQ Composite stock index reached a record high of 5132.52 points and closed that day at 5048.62 points, its highest value

since inception, signalling the peak of the fascination with Internet company shares. With the emergence of the highs in internet stocks, there were increasing calls suggesting that companies were significantly overvalued, including from Bloomberg and The Economist. As such commentary increased, so did the investment zeal of funds, which, for example, in 1998 invested 38% of their investment funds in dot.coms (Hayes 2019). Critical commentary on the wisdom of investing in technology companies was covered up by the companies' marketing and PR activities. In 2000, of the 35 commercials presented at the time, as many as 17 belonged to dotcoms, which had to pay an average of $2.2 million for them at the time. These spots produced very little return on investment (ROI) and generated only temporary brand interest. As the data shows, two-thirds of these companies saw a significant drop in website traffic just one week after the Super Bowl. (AdEverest 2019). As pl.economy-pedia.com points out: *the massive sell-off of shares, registered on 13 March 2000, triggered a chain reaction of sell orders. If we add to this the panic of investors, fund managers and the liquidation of institutional positions, we have achieved a drop of more than 9% in the Nasdaq index in less than a week. The biggest clear evidence of the failure of the 'get big fast' strategy came after Christmas 1999, when online retailers performed poorly. By 2001, the bubble was deflating at full speed. Most dot-com companies ceased operations when they failed to make a profit and had no financing left. In total, the internet boom caused technology companies to lose £5 trillion in value, from March 2000 to October 2002.* (pl.economy-pedia.com 2020). An additional factor encouraging investment was also the media interest in the topic of new internet companies, the so-called dot coms. In the period 1998–2000, one can observe an increased interest in investment topics in established magazines, as presented by The Economist and the New York Times in Chart 2.

Examples of companies that gained significantly during the bull market and closed during the downturn include (1) Boo.com, an online clothing shop. The company spent $188 million in six months. It went bankrupt in 2000; (2) Gadzoox – a database company. Gadzoox shares tripled in value on their first day on the stock market valuing the company at $1.97 billion. 4 years later the company was sold for $5.3 million; (3) iVillage – a mass media company. This company's share prices rose 255% to $84. The company was acquired by NBC for $8.5 in 2006 and subsequently closed (Wiech 2022). The crisis was also widely reported in the popular press, e.g. in The Guardian, which on its front page called the crisis a dot.com bomb (dot.com bomb).

Chart 2

Number of press publications on Internet businesses in The Economist and The New York Times, 1998–2000



Source: Web archives of The Economist, The New York Times and the webarchive.com tool

Image 1

Articles in The Guardian


Finance

Bubble bursts Iron laws of the market bring a sharp dose of reality to the virtual business world

The year dot.com turned into dot.bomb

Rise and fall

The Guardian

Opinion & Letters

Grave new world

Source: https://www.theguardian.com/business/gallery/2008/oct/15/archive-past-financial-turmoil

As Stefan Theil notes: *the media followed the bubble, not the flow of information. What's more, the ubiquitous news theme works just as well as advertising. The bubble was able to grow because we were inundated with investment advice investment tips and stories of IPO riches in almost every medium. Magnified and amplified by the press, the growing market monopolised our attention* (Theil 2013).

The dotcom crisis changed both the investment attitude towards interactive companies and also made a change in the structure of the media. Editorial departments began to form technology descriptive or new technology analytical departments so that the feedback provided by the media had a greater level of specialisation.

3. Lehman Brothers crisis

Founded in 1850, Lehman Brothers was one of the most solid investment institutions in the US financial system until 2008. During its early years, the company was primarily involved in commodities trading, mainly cotton. As the years passed, real estate investments began to play a greater role, as well as the gradual opening of banking establishments as early as the second half of the 19th century. In 1887, Lehman Brothers became a member of the New York Stock Exchange. Despite the turbulent events of the following years, such as the Civil War, the First World War, the Great Depression of 1929–1933 or the second global conflict, the company grew and began trading securities in the 1970s. In 1984, the company was taken over by Shearson American Express (for between $350 million and $360 million), but just ten years later, as a result of financial troubles, the joint stock company Lehman Brothers was formed back. From the beginning of the 21st century, on a large scale, the bank started to invest strictly in mortgages, which in the first years resulted in huge profits. Among other things, the company was involved in: granting mortgages, buying them from other banks, issuing mortgage-backed securities, and financing the purchase or construction of commercial real estate. 2004 total assets reached a record $137 billion. A year later, the bank was named 'Best Investment Bank' by the British magazine Euromoney. In 2006 and 2007, the company achieves the best financial result among the largest companies of the United States and Canada, and becomes the leader of the British stock market in terms of turnover. During the same period, property prices in the United States (a phenomenon dubbed the subprime crisis) began to fall, leading Lehman Brothers to collapse in record time. On 15 September 2008, Lehman Brothers declared bankruptcy and stock indices began to fall at a rapid pace. As a result, the US went into recession for two years (2008–2009). Within a year, the number of unemployed people in the US rose from 7 million to as many as 15 million. The subprime crisis was triggered by a large drop in US house prices following the collapse of the real estate bubble, which led to mortgage defaults, foreclosures and the devaluation of real estate-related

securities. Declines in housing investment preceded the Great Recession followed by reductions in household spending and then business investment. The reductions in spending were more significant in areas with a combination of high household indebtedness and greater declines in housing prices. The causes of the crisis were many, with commentators attributing varying levels of blame to financial institutions, regulators, credit agencies, government housing policy and consumers, among others. Noel Banks points out that one of the most important factors that triggered the crisis was creative information policies on credit risks linked to a relaxed credit system. Also contributing to the recession were the policies of media companies which, as Elijah Wood has pointed out, irresponsibly presented propaganda content infrequently camouflaging the persuasive (advertising) nature of the message by offering this content as articles or affiliate interviews. At the time of the crisis, the media failed to exercise proper restraint, publishing sensationalist reports and exacerbating social unrest, which, according to some researchers, may have led to a prolongation of the crisis from 5% to 20% of its duration. In the above case, the change in media attitudes under the influence of the dynamics of the economic situation is clearly visible, as presented in detail in Table 1.

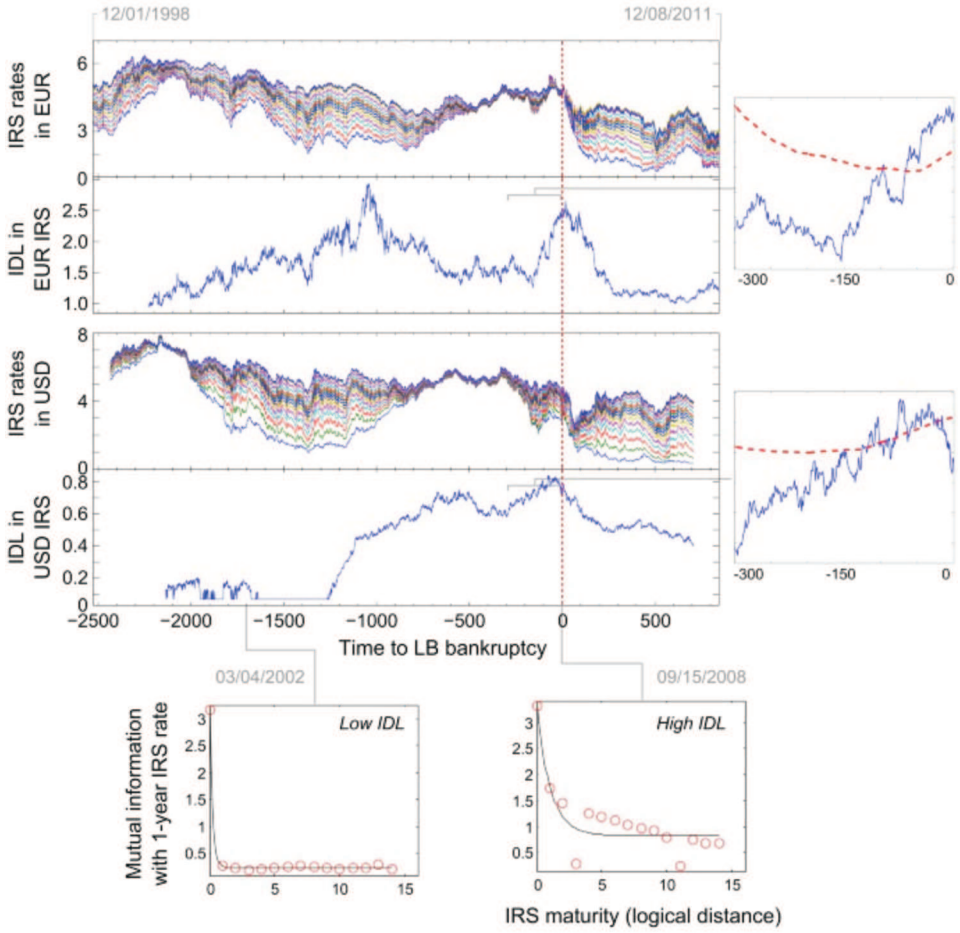
Table 1

Examples of headlines in the US press

Enthusiasm	"Generations of Prosperity"
Neutral attitude	"Is there an economic problem?"
Scepticism	"Tough times for mortgages"

Interestingly – the dispersion of information as a signal of the Lehman Brothers crisis could be observed using non-media information from the specialised information market. As Rick Quax, Drona Kandhai and Peter M. A. Sloot point out in their paper: *The decline in IDL after bankruptcy is consistent with the interpretation of the critical phenomenon as a release of accumulated stress1, similar to the way an earthquake releases accumulated tension between tectonic plates. Together, these two observations suggest that the Lehman Brothers bankruptcy was a self-organised critical transition and that the IDL index is capable of detecting it.* (Quax et al. 2013). The authors go on to describe that by observing the IDL indicator, it could have served as an early warning signal for the Lehman Brothers bankruptcy. After analysing the collected empirical material, the authors also defined a warning point, which they defined as the crossing of a critical point, as illustrated in chart 3.

Chart 3
Illustration of the Quax, Khandai and Sloot hypothesis on the predictability of the Lehman Brothers collapse crisis through IDL analysis



Source: https://www.nature.com/articles/srep01898

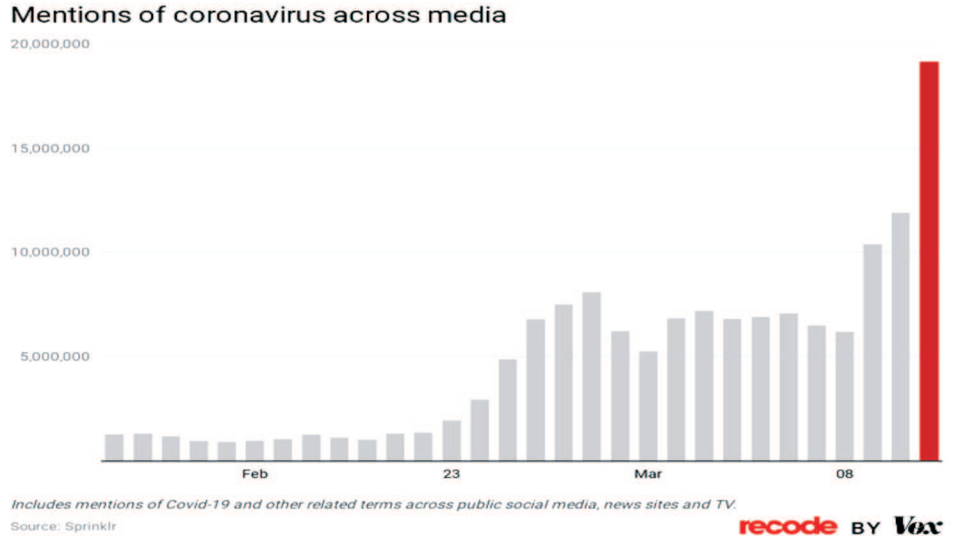
4. Infodemia COVID-19 (SARS-COV2)

The emergence of the global SARS-COV2 outbreak has changed both the infosphere and the way news is presented and perceived in the media space. The first media reports in Europe were of a reporting nature, reporting on the outbreak in Wuhan and its impact on the local community. Expert voices were largely trivialised. It was only with the emergence of the first cases of infection that the information focus changed. There were

reports of problems with the diagnostic procedure, individual safety measures and possible shortcomings. After this event, more and more industries started to monitor pricing and market demand policies. In particular, in the first stage of the pandemic, the direct protection products industry, due to insufficient capacity, increased prices; in addition, the market went into a speculative frenzy, which, among other things, led to the cost of a disposable mask reaching a price of PLN 10 on an auction portal in Poland in March 2020 (as at 30.08.2022 – 0.29 gr). The situation was similar in the disinfectant manufacturer industry. At the same time, stock market investors began investing in the biomedical and pharmaceutical industries. For example, the Polish manufacturer Bioton rose from PLN 2.08 per share on 13.03.2020 to PLN 5.54 on 31.07.2020 within two months. The food services market was also unsettled by the initial reports of lockdown and its introduction. A factor that to some extent determined consumer behaviour was the flood of information provided by the media and the negative tone of the published information. In the process of absorbing information, for the first time on a massive scale, there was a phenomenon of receiver synthesis of true information and disinformation supported by the phenomenon of misinformation. The number of monothematic information on COVID-19 increased significantly with the global spread of the virus (the tipping point was reached on 12 March 2020), as presented in Chart 4.

Chart 4

Media mentions of coronavirus

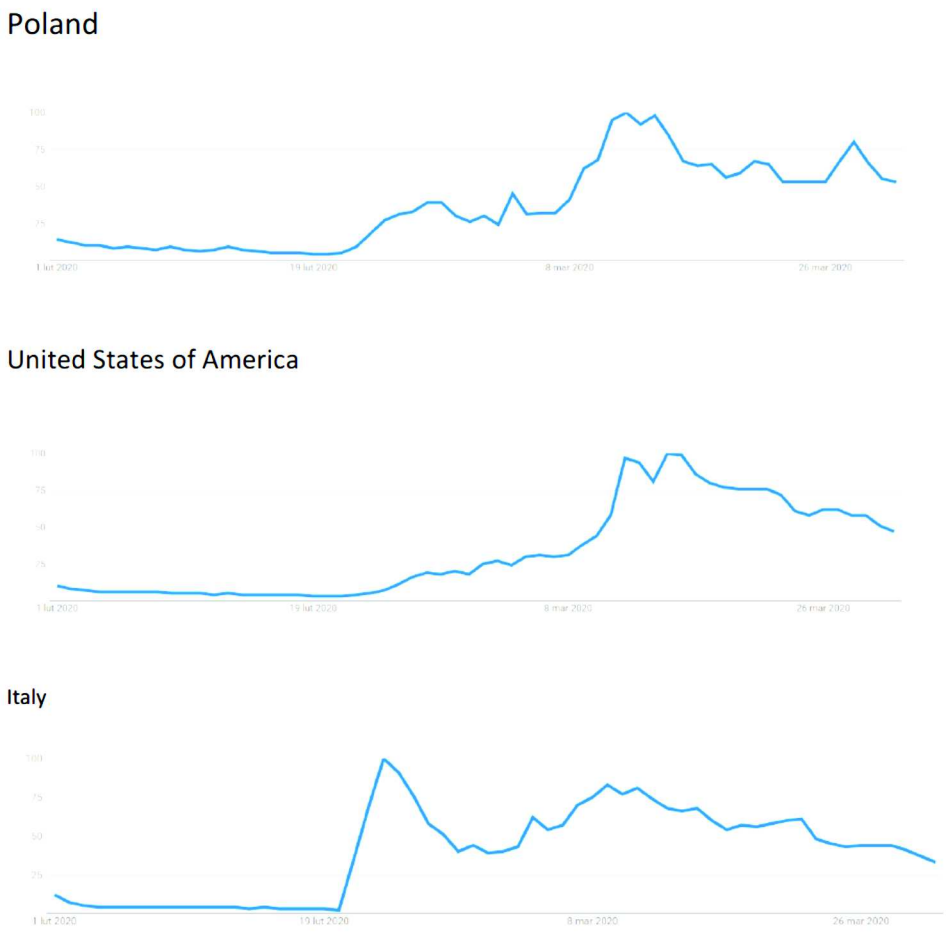


Source: https://www.vox.com/recode/2020/3/12/21175570/coronavirus-covid-19-social-media-twitter-facebook-google

An analysis of the use of the Google Trends tool indicating the number of searches on Google's most popular search engine also shows the great interest of internet users in coronavirus and its inclinations, as presented in Chart 5.

Chart 5

Searches for the term Coronavirus in selected countries for the period 1.02.2020–30.03.2020



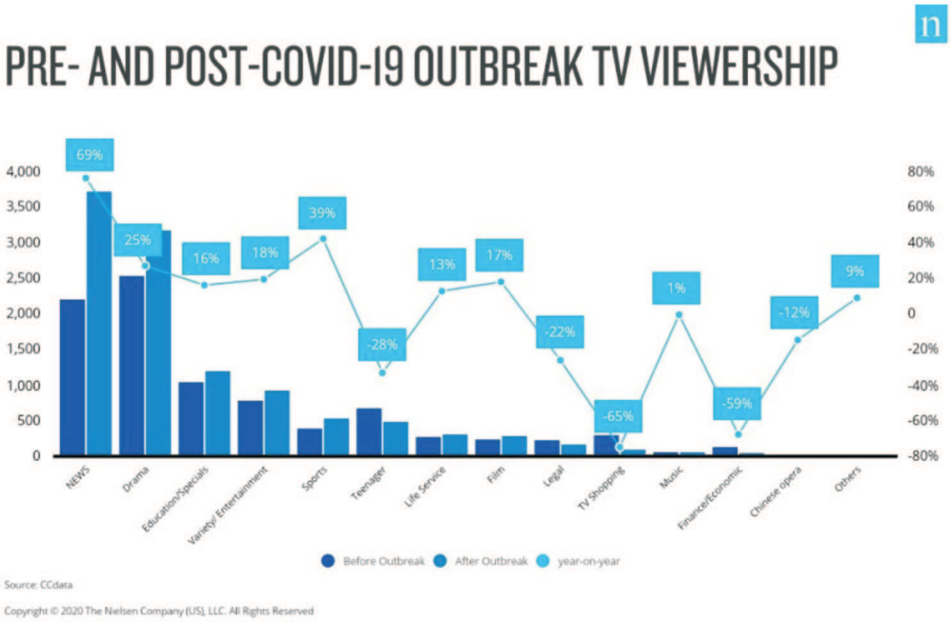
Source: Own compilation based on Google Trends.

Through the introduction of restrictions and a rigid information policy, the structure of the retail market has changed. The phenomenon of the growth of large players in the online sales markets (Amazon, Allegro) and postal companies (FedEX, DPD or Paczkomaty) can be observed. There has been a significant, almost 40%, growth in Polish e-commerce in 2020.

This trend is characterised by irreversibility. According to PwC (2021), as many as 75 per cent of respondents declare that they will maintain the frequency of e-commerce purchases at the same level as now, and 10 per cent anticipate an increase in e-commerce activity. Thanks to the successful campaigns of the online retail industry and shipping companies, shoppers' habits have also changed. Data aggregated by Marta Jędrzejak shows that 36% of shoppers during the pandemic period opted for the click&collect service for the first time (e.g. parcel machines) and 62% planned to do so even after the restrictions had ceased. Analysing the Infosphere, two interesting studies can also be cited. In the first, the Nielsen Research Institute presented a diversification of interest in TV genres. The results of the analysis showed a sharp increase in interest in news programmes with a decline in audience interest in shopping and economy/finance programmes. The results of the Nielsen study are presented in Chart 6.

Chart 6

Nielsen study of TV audience during COVID period



Source: https://www.nielsen.com/insights/2020/the-impact-of-covid-19-on-media-consumption-across-north-asia/

The second study was conducted in Poland and shows a surge of media interest in COVID-19 between January 2020 and March 2020. The data shows that from mid-January to 12 March, 235,000 publications about the

coronavirus appeared in Polish media. As many as 1.1 million social media posts were published during the same period. The largest increase in publications on COVID-19 occurred in the last days of February and the beginning of March, when journalists began to address the threat of the outbreak – still an epidemic at the time – reaching Poland. The fastest increase in the number of publications both in both traditional and social media occurred on 9 March. Three out of four mentions of COVID-19 appeared online. This was followed by radio, press and television. A recording of a speech by the director of the Sanepid in Słubice proved to be the most popular (reach of 7 485 472 on Facebook), and in terms of the number of reactions, a photo by youtuber mamikoyoko taken in Singapore (54 821 likes on Instagram) (Wirtualnemedia.pl 2020). Interestingly, the increase in the number of news items relating to the coronavirus translated, after analysis with the Google Trends tool, into a jump in internet users' interest in queries in the search engine: "online shopping", "internet shopping" and "home delivery".

5. Conclusion

Contemporary social development is defined in some studies as the ability to acquire and interpret information. On the other hand, with a significant overproduction of information, we are faced with the problem of too many mutually exclusive sources, which can lead to cognitive dissonance at the individual level and misdiagnosis of the situation at the level of groups and societies. The examples presented above illustrated to some extent the role of information in the process of economic and social change and social changes. A huge role, if not a decisive one, in market decisions is played today by adequate information research. Using examples from two decades, we can also observe the influence of the media and experts on investment decisions or market changes. The example of the dot.com crisis indicated the weakness of the professional media in predicting the market situation; contrary to the principle of cool calculation, editors allowed themselves to be carried away by their apparent enthusiasm in describing a curved reality. The Lehman Brothers crisis highlighted, as has been shown, the lack of caution in analysing information from specialist sources. The Covid 19 infodemia demonstrated consumer flexibility in market exploration. The next step will be to learn how to select information appropriately, a process that will not necessarily benefit traditional media and will make markets even more unpredictable and dependent on the reinterpretation of information provided to the public.

NOTE

[1] Internet technology start-ups

LITERATURE

AdEverest (2019) *The dot.com bubble and its impact on the market*, https://histmag.org/Banka-dotcomow-i-jej-wplyw-na-rynek-19351 (accessed 28.06.2022).

Ash R.B. (1965) *Information theory*, Hsieh-Cheng, pp. 339.

Castells M. (1996), The Information Age, Oxford: Blackwell.

Tappscot D., Williams A. 2006, Wikinomics: How Mass Collaboration Changes Everything, New York:Portfolio.

Czekaj J. (2012) Podstawy zarządzania informacją, Wydawnictwo Uniwersytetu Ekonomicznego w Krakowie, Kraków 2012.

Dziekański, 2012, Information as an economic good that is a source of competitive advantage, https://cejsh.icm.edu.pl/cejsh/element/bwmeta1.element.desklight-0e295304-b717-4902-8304-cb09964da59c/c/28_Dziekanski.pdf (accessed 2.07.2022).

Eppler, M. J., Mengis, J. (2004). *The concept of information overload: A review of literature from organization science, accounting, marketing, MIS, and related disciplines*. Information Society, 20(5), 325–344.

Forbes, 2009, *The True Story of Allan Greenspan*, https://www.forbes.pl/finanse/prawdziwa-historia-alana-greenspana/25kdj5j (accessed: 28.06.2022).

Galbraith J.K.; Hale T. (2004). *Income Distribution and the Information Technology Bubble*, University of Texas Inequality Project Working Paper 24/2004.

Goodnight, G; Green jr, S. (2010). *Rhetoric, Risk, and Markets: the Dot-Com Bubble*. 'Quarterly Journal of Speech' no 96/2010.

Hayes A. (2019) *Dotcom Bubble*, https://www.investopedia.com/terms/d/dotcom-bubble.asp (accessed 28.06.2022).

Joosten N.T. (2012). *The effects of the Dot Com bubble and the Credit Crisis on leverage ratios of US non-financial firms*, Tilburg School of Economic and Management.

Molla Rani (2020) *How coronavirus took over social media*, https://www.vox.com/recode/2020/3/12/21175570/coronavirus-covid-19-social-media-twitter-facebook-google (accessed: 28.06.2022).

Naughton J.(2016). *The evolution of the Internet: from military experiment to General Purpose Technology*, Journal of Cyber Policy, no 1/2016.

en.economy-pedia.com (2020), *The dotcom bubble*, https://pl.economy-pedia.com/11031534-dot-com-bubble (accessed: 28.06.2022).

Plan Thung (2020) *If This Is Another Dot-Com Bubble, the Cloud Has a Silver Lining*, https://www.bloomberg.com/opinion/articles/2022-05-12/if-tech-crash-is-another-dot-com-bubble-the-cloud-has-a-silver-lining (accessed: 28.06.2022).

PWC (2021) *E-commerce market forecast in Poland*, https://www.pwc.pl/pl/media/2021-02-09-analiza-pwc-prognoza-rozwoju-rynku-ecommerce-w-polsce.html (accessed: 28.06.2022).

Quax, R., Kandhai, D., Sloot, P. *Information dissipation as an early-warning signal for the Lehman Brothers collapse in financial time series. Sci Rep*, 1898 (2013), https://doi.org/10.1038/srep01898 (accessed: 28.06.2022).

Rifkin, J. (2000) *The Age of Access*. Penguin Putnam.

Shedden D. (2000) *Today in Media History: the Dot-com bubble burst in 2000*, https://www.poynter.org/reporting-editing/2015/today-in-media-history-the-dot-com-bubble-burst-in-2000/ (accessed: 28.06.2022).

Sorkin A.R. (2000). *INTERNATIONAL BUSINESS; Fashionmall.com Swoops In for the Boo.com Fire Sale*, "The New York Times".

Stefanowicz B. (1987) Information quality in infological terms, 'Statistical News' No. 1, pp. 29–31.

Theil S. (2013) The *Media and Markets: How Systematic Misreporting Inflates Bubbles, Deepens Downturns and Distorts Economic Reality*, https://shorensteincenter.org/wp-content/uploads/2014/06/d86-theil.pdf (accessed: 28.06.2022).

Usborne D. (2000) *Dot Com founder unveiled*, The Independent.

WHO (2019) *Infodemic*, https://www.who.int/health-topics/infodemic#tab=tab_1 (accessed: 28.06.2022).

Wiech K. (2022) *Dotcom*, Encyclopedia of Management, https://mfiles.pl/pl/index.php/Dotcom (accessed: 21.06.2022).

Wirtualnemedia.pl (2020) *1.1 million social media posts about coronavirus, 235,000 publications*, https://www.wirtualnemedia.pl/artykul/koronawirus-publikacje-media-internet-jak-korzystac-z-mediow-fake-newsy-o-koronawirusie-lista (accessed: 28.06.2022).