Bank i Kredyt 51(3), 2020, 239-262

BANK I KREDYT
BANK & CREDIT

The impact of ratings and other information on the fluctuation of Polish stock indexes

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Submitted: 10 April 2019. Accepted: 9 December 2019.

Abstract

Information is a critical element in the functioning of financial markets. Credit rating agencies are one of the most important sources of information and their announcements are treated as an indicator of trust in a given entity. The rating itself, as well as information regarding a forecast rating, may lead to significant changes in investment decisions and, as a result, affect stock indexes. The purpose of the article is to identify the impact of ratings and other information on the fluctuation of Polish stock indexes. The subject of the study was a comparison of the announcement dates of rating agencies' decisions and other information with the fluctuations of selected stock indexes of the Warsaw Stock Exchange in the years 2016–2018. The conducted research allowed to determine the relationship between the date of publication of the ratings and other information and the change in the values of the studied stock indexes.

Keywords: rating, information, stock indexes, perception, behavioural finance

JEL: G24, G41, G11

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1 Introduction

According to the classic finance theory, having information allows effective investment decisions to be made. The main source of financial information is financial reporting, on the basis of which further economic analyses are carried out. However, this is not the only information that affects investors' decision making. A special part in influencing investment decisions is attributed to information provided by rating agencies.

A rational approach to investing requires the use of a wide spectrum of methods to assess the profitability of the project. A skilful combination of both fundamental methods and elements of technical analysis should provide the optimal amount of information. However, in addition to financial reporting data, ratio or trend analyses, investors receive plenty of other information which positively or adversely affects final investment decisions. The investment decision-making process is associated with uncertainty as to their effects and, as a result, with the risk of losses. Time and profit pressure, as well as aversion towards losses, are the factors that significantly disturb rational analysis of information.

Information is every factor that decreases the degree of ignorance about the studied phenomenon. In the cybernetic approach, information understood colloquially is the transfer of a certain content from the sender to the recipient (Sej-Kolasa 2002, p. 14). Information is important in the communication process and should have a quantitative and squalitative dimension. In external communication, it is less formal, less structured, and with a lesser possibility of control (Czekaj 2000, p. 18). The concept of information refers to data (measures or descriptions of objects and events) that are unknown to their recipients, and can reduce their uncertainty when making decisions (Dobija 2005, p. 272). In macroeconomics, investors have at their disposal a number of information sources, specialized agencies and providers involved in the preparation and publication of data. In general, macroeconomic information includes data on the level of GDP, the country's balance of payments, as well as information on the state budget revenues and expenses, etc. (Mikołajewicz 2011, pp. 120–123). However, the information at the macroeconomic level can include both announcements from rating agencies as well as political events (e.g. presidential or parliamentary elections), or announcements of proposals for new social programmes affecting the state's economy.

The investor may find the financial data analysis to be insufficient. This can be considered from two perspectives. On the one hand, additional information from various sources may highlight aspects not covered in the periodic and annual reports. A factor that is insignificant from the point of view of the principles of preparing and presenting reports may turn out to be decisive in a given situation, foundational for making or changing the decision. On the other hand, it is human behaviour that shapes the changes in the stock market. Despite a very good financial situation and prospects for development, information aggravating an organization's image, whether justified or not, can drastically change the company's listing. Knowledge of natural mechanisms that affect decision-making, as well as the perception of intentional manipulations, prompts a deeper analysis of available information. The aforementioned premises allowed the assumption that investment decisions and, consequently, the fluctuation of stock indexes, may be significantly influenced by announcements from rating agencies and other macroeconomic information.

The purpose of the article is to identify the impact of ratings on the fluctuation of Polish stock indexes. The article presents a comparison of the announcement dates of rating agencies' decisions and other information with the fluctuations of the selected stock indexes of the Warsaw Stock Exchange

in the years 2015–2018. Cross tables were used to verify the significance of the relationship between the analysed variables, and the chi-square test for two variables was performed using the SPSS statistical data analysis software.

2 Rating and other sources of information on financial markets

Investors participate in the market, defined as the result of actions and feelings of all its actors (Kahn 2011, p. 40). It should be emphasized that the market is created by people, and it is on their preferences, and consequently, their behaviour, that the applied algorithms are based. The Polish National Investor Survey, conducted by the SII (Stowarzyszenie Inwestorów Indywidualnych), indicated the most important sources of information used by investors in the process of making investment decisions (Figure 1).

Current and periodic reports of companies ranked first, which seems natural, as information from financial and operational reporting should constitute the basis for investment analyses, for the investors to assess a company's financial condition and, as a consequence, for investment decisions. Their quality and timely publication is very important from the investors' point of view. Company websites as well as reports and comments of analysts are also an important source of information for them[1]. The ultimate source of information, combining many types of the above mentioned sources, is rating. By definition, a rating is the result of multi-faceted analyses, which forecasts the issuer's future capacity and legal responsibility to settle its liabilities in full and on time (Jaworski, Zawadzka 2011, p. 593). The rating is regarded as an indicator that determines the degree of trust in the entity issuing securities (Cichy 2013, p. 90). The result of the analysis, in the form of a rating or a forecast, is widely published in both online and traditional media, and may lead to significant changes in investors' decisions, regardless of whether the assessment is correct. A downgrade forecast may lead to a genuine deterioration of the entity's situation, caused by investor fear.

The rating is attributed to many functions on the financial markets. First of all, a rating provides decision makers with the information necessary for effective investment. Other functions are directly related to the informative function of the rating. The rationalization function postulates increasing investment efficiency by improving information processes, as well as rationalizing decision-making situations. On the other hand, the ordering function refers to reducing information noise by eliminating unnecessary or false information. In addition to the popularizing function, i.e. the dissemination of information about the subject of analysis, an important element is the so-called equal opportunity (Zieliński 2010, p. 51). The purpose of rating is to provide access to information for all market participants, not only institutions, but also individual recipients. Credit rating agencies have the ability to provide professional information because they have access to representative statistics, and employ qualified specialists. This is why the agencies are often considered leaders in the process of quantifying the investment asset risks. However, given the diverse audience, ratings should be simplified to the extent that they present complex quantitative and qualitative data in a synthetic and standardized manner, ensuring readability and supporting comparative analysis.

Ratings are also considered impartial, which is motivated by its area of impact, between issuers and investors. In addition, credit ratings are included in the regulations and criteria regarding securities

[1] Polish Investor Survey 2018, Stowarzyszenie Inwestorów Indywidualnych, www.sii.org.pl, accessed on 19 December 2018.

and their issuers on regulated markets (Wiśniewski 2011, pp. 130–131). Not only business entities, but also banks, financial institutions and countries are rated. Although the ratings are prepared separately for each entity, they are not completely separate. From the organization's point of view, the sovereign ranking of a country in which it is based is also important, because the sovereign rating is the upper limit for the rating of business entities (Cichy 2016, p. 22). The rating of a country, known as the sovereign rating, is a concise assessment of the government's ability to pay public debt and interest on time, as well as servicing debt securities issued or guaranteed by the Treasury (Afonso, Gomes, Rother 2007, p. 8). Macroeconomical, socio-political and institutional aspects are also taken into account as part of sovereign ratings (Block 2004, pp. 917–946).

However, there are several paradoxes associated with the reception of rating agencies' information. The projected rating changes are considered significant information, although they actually have little value. In addition, credit ratings do not help business entities manage risk, but many are prompted by the ratings. Many foreign studies point to the non-accidental impact of rating agencies on financial markets. Norden and Weber (2004, p. 2837) analysed the reaction of the stock market and its derivatives to the announcements of rating agencies, which have proven impactful, especially when they relate to a downgrade. In turn, the results of the studies by Micu, Remolon and Wooldrige (2004, p. 13) showed that all types of rating messages had a significant impact on the reactions of the analysed market. This relation is also observed in research conducted after the global crisis of the years 2007–2008. Research by Bayar, Kilic and Kilinc Savrul (2013, p. 143) showed that the sovereign rating affects not only the government sector, but also the financial sector, with rating agencies' decisions impacting financial markets. In turn, the results of research by Fatnassi, Ftiti and Hasnaoui (2014, p. 956) indicate the impact of a sovereign rating awarded by the three largest rating agencies on the returns generated by the stock market. Sensitivity to a sovereign rating may depend on the country's economic situation and its macroeconomic conditions (Williams, Alsakka, Gwilym 2013, p. 576). Research also indicates that information on sovereign ratings shape investors' attitudes and, as a result, determine stock indexes (Tran, Alsakka, Gwilym 2019, p. 1230).

During the global crisis, the credibility of the rating agencies was undermined as a result of a lack of transparency, conflicts of interest and misleading the audience. Nevertheless, rating agencies are still important opinion leaders, with an impact on investors. The rating procedure is executed in a formalized and standardized manner, but ultimately the decision is taken by rating committees. It is then that the quantitative and qualitative factors are considered. As a result, the final rating decision is largely subjective, results from a free assessment of the factors affecting the level of risk (Chisholm 2011, p. 237). Therefore, the final announcement of the rating agencies is also determined by psychological factors taken into consideration in assessing the situation at the macroeconomic level of a given country.

3 Psychological aspects of economic information processing

Regardless of the preferred form of economic analysis, having information is what investors and analysts strive for. Proponents of technical analysis consider the fluctuation of trends and cycles, as well as repetitive formations, important. Technical analysis is often referred to as simplified psychological analysis of the market, because it is largely based on the feelings and expectations of investors. However, its effectiveness raises doubts (Zielonka 2011, pp. 19–21). The popularity of this method of

analysis may result from the cognitive tendencies of the human mind to search for specific patterns and representations (Zweig 2008, pp. 13–14). However, the information received in the perceptual process is not an accurate representation of the outside world (Jachnis 2007, p. 58). During the active process of perception, contextual cues, expectations and experience are used (Nęcka, Orzechowski, Szymura 2006, pp. 278–279). As a result, the information sought is arranged in patterns, even if they are independent and random. These phenomena are intensified, among others, in conditions of uncertainty. The greater the uncertainty, the greater the chance of triggering behavioural factors in perception (Falkowski 2002, p. 24). It should be noted that the cognitive tendencies of the human mind can modify the information received. The occurrence of trends is an objective phenomenon, while they may originate from the expectations of investors and analysts.

On the other hand, proponents of fundamental analysis believe that the use of available information allows to determine the real value of the stocks, free from the influence of psychological factors, e.g. emotions or cognitive distortions, which is the subject of criticism (Zielonka 2011, pp. 25–26). However, both organizations and business entities do not have unlimited capability to process information. Heuristics, i.e. cognitive strategies that reduce the use of cognitive resources and make quick decisions (Gerrig, Zimbardo 2012, p. 270) greatly impact the process of information processing. However, heuristic information processing cannot guarantee accuracy, and often leads to erroneous conclusions. Due to the availability, heuristic, expressive and recently noticed information reach the audience the fastest. Information presented in the media, repeated behind the scenes in financial markets and discussed by experts, may prevail over data from previous economic analyses by sheer power (Zaleśkiewicz 2012, pp. 63–67). In turn, the affect heuristic leads to linking opinions to a certain degree with emotions (Slovic et al. 2007, pp. 1333–1335). Under the influence of emotions, attention is directed to specific parts of the decision problem and the tendency to fully verify relevant information decreases. One of the sources of emotions is the emergence of unexpected information when the mind automatically looks for similar experiences and emotions associated with them. As a result, a positive association of information motivates to act in accordance with a positive stimulus (Adamczyk 2017, p. 42). On the contrary, when a given information triggers experiences related to negative emotions, then the decision-maker receives a motivational signal to avoid the situation.

The process of information processing may also be modified by a number of psychological factors such as personal differences and group mechanisms. Experienced investors, with extensive knowledge of market mechanisms, often underestimate the impact of a conjured reality. In the face of information overload, time pressure and the strive to maximize benefits, one succumbs more easily to cues and suggestions. This explains, for example, the social proof principle, according to which certain behaviours are considered correct in a situation when one observes others who behave in such a way. Confirmation of the legitimacy of our behaviour is especially desirable in people similar to oneself, performing similar social roles (Cialdini 1996, p. 113). Therefore, investors observe the behaviour of other stock market participants. An important factor is also conformity, defined as succumbing to pressure (real or imagined) by others who make up the majority in a situation (Wojciszke 2012, p. 232). Observation of the behaviour of other investors contributes to the snowball effect, i.e. over time more and more people start following the upcoming trend (Tyszka 2010, p. 74). These types of phenomena can occur naturally, but they are often the result of informed actions taken by interested parties.

An important source of information is ratings, treated as the trove of inaccessible information. The assessments have a very large impact on the perception of the financial position of business

entities. It should be noted that often before the final rating is issued, credit rating agencies provide forecast information, planned ratings or opinions through the media. Such tentative messages can be a method for testing investors' responses, or deliberate manipulation.

4 Comparison of ratings and other information with the fluctuation of WSE indexes in the years 2015–2018

Observation of information concerning the political and economic changes in Poland, reported by the media in the years 2015–2018, was an inspiration to review decisions on Poland's rating in recent years (2016–2018). It was assumed that in the period around the date of the planned rating review there would be noticeable changes in the listings of selected indexes. The dates of individual decisions regarding Poland's rating were compared with the main stock indexes of the WSE – the WIG, WIG20, mWIG40 and sWIG80.

Over the past twenty years, Poland's ratings issued by the rating agencies of the so-called Big Three – Standard and Poor's, Moody's and Fitch – showed an upward trend or were stable. By 2016, none of the agencies mentioned above had lowered their credit assessment rating. It was only the concerns of rating agencies resulting from the atmosphere around political changes in 2015 in Poland, both presidential and parliamentary, and especially the announcement of the implementation of new social programmes, that triggered speculation on the financial markets. Four key dates related to the 2015 elections in Poland were identified: 10 May – 1st round of presidential elections, 24 May – 2nd round of presidential elections (a right-wing candidate won), 25 October – parliamentary elections (won by Zjednoczona Prawica – the United Right), 16 November – swearing in of the government.

Along with the beginning of political changes, the downward trend in the WSE's main indexes started. At that time unfavourable macroeconomic information appeared, presented by various media, institutions and rating agencies. At that time, rating agencies began intensive observation of events in Poland, announcing often "unofficial" opinions as to the future economic situation of the country. Figure 2 presents the fluctuation of WSE indexes in 2015, along with the marked dates of political events. As observed, on the dates of political events (1–4) visible changes in the WSE stock indexes occurred.

For the first time in twenty years, after the above-mentioned political changes, in January 2016 the Standard and Poor's (S&P) agency downgraded Poland's rating from A- to BBB+ for foreign currency and from A to A- for national currency (Table 1). In addition, S&P changed its outlook from stable to negative.[2]

The description of the rating indicates medium-level credit risk, good financial credibility and a sufficient debt service. However, an increased susceptibility to adverse economic conditions was emphasized. The S&P agency justified its decision with the political change in Poland. Its analysts believed that political decisions of the Law and Justice (Prawo i Sprawiedliwość) party could lead to the destabilization of leading state institutions, and as a consequence could weaken the Polish economy and its debt service[3]. The S&P also expressed their doubts as to the future independence of Narodowy

[2] www.rp.pl, accessed on: 25 April 2018.
[3] www.strefainwestorow.pl, accessed on: 20 May 2018.

Bank Polski[4]. The Ministry of Finance, on the other hand, emphasized that the decision of the S&P agency to lower Poland's rating is incomprehensible from the point of view of economic and financial analysis. In addition, this rating was in conflict with the ratings of other agencies, major international financial institutions and financial market participants[5]. In turn, after the January decision of the S&P, concerns emerged regarding future ratings.[6] Half a year later, the S&P agency maintained Poland's rating at BBB+, with a negative outlook. The explanatory memorandum stated that the negative outlook reflects the agency's opinion of over 30% probability of further downgrades within the next 18 months if the credibility of the monetary policy is weakened or if public finances deteriorate compared to their expectations[7]. On the other hand, in May 2016, the Moody's rating agency maintained its previous ratings for Poland. However, it changed the rating outlook from stable to negative, justifying the decision with the risk of future weakening of Poland's fiscal position and deterioration of the investment climate in Poland. The Moody's agency decided that the dispute over the Constitutional Tribunal may deteriorate Poland's relations with the European Union, which in turn would have a negative impact on investments in Poland.[8] The reasons for this decision also included the fiscal risk related to a significant increase in the current expenditures, e.g. the Family 500+ programme and the intention to lower the retirement age.[9] On the other hand, in 2016 Fitch Ratings maintained Poland's rating at the current level of A- and A, respectively, for liabilities in foreign currencies and in the national currency. The perspective was determined to be stable.[10] In its justification, Fitch emphasized the strong foundations of the Polish economy, manifesting itself in strong GDP growth. The agency's analysts said that the increased expenses of the state budget would be financed from higher tax revenues, which result from the improving economic conditions and VAT collection rates. They also predicted a gradual reduction of the budget deficit, starting from 2018. In addition, the banking sector was assessed as well capitalized, liquid and profitable. As a consequence, Fitch Ratings pointed to the possibility of a positive change in Poland's rating in the event of further high GDP growth and income convergence with the higher-rated countries, as well as a further reduction in foreign debt due to an improvement in the current account balance and capital inflow.[11]

In Figure 3, the dates of the rating agencies' decisions in 2016 included in Table 2 were assigned to the WSE index charts. There are noticeable fluctuations of the Warsaw Stock Exchange indexes on the dates of the rating agencies' decisions (from 1 to 6).

In 2017, Standard and Poor's maintained its rating at BBB+ and changed its outlook to stable. The change to a stable outlook was justified by balancing the risk of the expansive fiscal approach (sealing the VAT system) and the increase in social expenditure (the 500+ Programme, the lowering of the retirement age), as well as by the continued economic growth.[12] The Standard and Poor's agency also drew attention to Poland's profitable and well-capitalized banking sector and its credible monetary policy.[13] In turn, Moody's continued to maintain its current rating in 2017, while increasing the outlook

[4] www.rp.pl, accessed on: 1 May 2018.
[5] www.bankier.pl, accessed on: 13 May 2018.
[6] www.rp.pl, accessed on: 1 May 2018.
[7] www.rmf24.pl, accessed on: 20 May 2018.
[8] www.rp.pl, accessed on: 1 May 2018.
[9] www.tvp.info, accessed on: 1 May 2018.
[10] www.newsweek.pl, accessed on: 11 May 2018.
[11] www.mf.gov.pl, accessed on: 20 May 2018.
[12] www.tvn24bis.pl, accessed on: 20 May 2018.
[13] www.polskieradio.pl, accessed on: 20 May 2018.

from negative to stable. It was then stated that the risk of excessive loosening of fiscal policy was limited and that the government's actions carried less risk for the investment climate in Poland.[14] Moody's maintained the highest ratings among the three major agencies during this period, while fluctuations occurred in terms of perspective. In 2017, the agency increased the country's economic forecasts. On the other hand, Fitch Ratings agency maintained its previous ratings with a stable outlook and raised the forecast of Poland's economic growth.[15]

In Figure 4, the dates of the rating agencies' decisions in 2017 included in Table 3 were assigned to the WSE index charts. There are changes of the Warsaw Stock Exchange indexes on the dates of the rating agencies' decisions (from 7 to 13).

In the first quarter of 2018, the Standard and Poor's rating agency maintained its rating at a reduced level of BBB+, but raised its outlook from stable to positive.[16] In the justification for the decision to raise the rating outlook, attention was paid to the forecast expansion of the Polish economy and the surprising results of the tax administration reform, which generated an increase in public revenues. The agency also referred to the judicial reform, which, according to Standard and Poor's, may threaten the country's further economic growth. In September 2018, the Standard and Poor's agency made another decision regarding the sovereign rating for Poland, raising it to A-, with a stable outlook.[17] The justification highlighted long-term sustainable economic growth, responsible fiscal policy and openness typical of large economies. In turn, Moody's in 2018 maintained its current rating at A2 with a stable outlook. Despite the agency's initial doubts about the impact of the judicial reform on Poland's institutional strength, Moody's eventually raised its GDP growth forecast from 4.4% to 5.0%. According to analysts of Moody's, Poland has reached the peak of activity in a given cycle.[18] Similarly, in 2018 the Fitch Ratings agency maintained Poland's current rating, with a stable outlook. Although economists expected an increase of the outlook, the agency maintained it due to the balanced level of risk for credit assessment. In the justification, the Fitch Ratings agency pointed to Poland's diversified economy and strong macroeconomic foundations, which are supported by the solid banking sector[19]. On the other hand, the GDP growth forecast for 2018 was increased from an estimated 3.9% to 4.4%.[20]

In Figure 5, the dates of the rating agencies' decisions in 2018 included in Table 4 were assigned to the WSE index charts.

In order to verify the relationship between the announcement dates of rating agencies' decisions and the fluctuations of the selected stock indexes, hypotheses were made under which the presented research variables are nominal.

The main hypothesis

The type of rating agency decisions regarding Poland's sovereign rating has an impact on the fluctuation of selected stock indexes.

14 www.bankier.pl, accessed on: 1 May 2018.
15 www.bankier.pl, accessed on: 1 May 2018.
16 www.mf.gov.pl, accessed on: 6 December 2018.
17 www.money.pl, accessed on: 6 December 2018.
18 www.bankier.pl, accessed on: 6 December 2018.
19 www.businessinsider.pl, accessed on: 6 December 2018.
20 www.money.pl, accessed on: 6 December 2018.

Specific hypotheses

H1: There is a relationship between a decrease in the sovereign rating or outlook for Poland and a decrease or sustainment of the downward trend of the WIG index.

H2: There is a relationship between an increase in the sovereign rating or outlook for Poland and an increase or sustainment of the upward trend of the WIG index.

H3: There is a relationship between a decrease in the sovereign rating or outlook for Poland and a decrease or sustainment of the downward trend of the WIG20 index.

H4: There is a relationship between an increase in the sovereign rating or outlook for Poland and an increase or sustainment of the upward trend of the WIG20 index.

H5: There is a relationship between a decrease in the sovereign rating or outlook for Poland and a decrease or sustainment of the downward trend of the mWIG40 index.

H6: There is a relationship between an increase in the sovereign rating or outlook for Poland and an increase or sustainment of the upward trend of the mWIG40 index.

H7: There is a relationship between a decrease in the sovereign rating or outlook for Poland and a decrease or sustainment of the downward trend of the sWIG80 index.

H8: There is a relationship between an increase in the sovereign rating or outlook for Poland and an increase or sustainment of the upward trend of the sWIG80 index.

Nominal scale variables

The independent variable

Type of decision on Poland's sovereign rating: upgrade vs downgrade of a rating or a rating outlook.

The dependent variable

The direction of the fluctuation of the stock index: increase or sustainment of the upward trend of the index vs decline or sustainment of a downward trend of the index.

Results

In order to verify the significance of the relationship between the analysed variables – the independent variable (type of decision on Poland's rating) and the dependent variable (the fluctuation of the stock index), which are nominal variables, were tested for the independence of two variables with the chi-square test.

In the case of the WIG index, the test result shows a significant relationship between the rating information and the fluctuation of the WIG index χ^2 (1 N = 18) = 10.13; $p < 0.01$ (Table 5).

The strength of the relationship between the analysed variables measured by the phi statistics indicates a clear relationship between the rating information and the fluctuation of the WIG index, $\phi = 0.75$; $p < 0.01$. Following announcements from rating agencies regarding the decisions to downgrade a rating/outlook, or to sustain a negative perspective in subsequent periods, a decline or sustaining of the decreasing trend of the index were more often observed than an increase or sustaining an upward trend of the WIG index, which allows adopting the H1 hypothesis. On the other hand, following the information about upgrading the rating/outlook or sustaining a positive perspective, the decrease or sustaining the downward trend in the WIG index was significantly more often observed, and thus the H2 hypothesis was confirmed (Figure 6).

The results of the analyses also show a significant relationship between the rating information and the WIG20 index χ^2 (1 N = 18) = 7.48; $p < 0.01$ (Table 6).

As in the case of the WIG index, the strength of the relationship between the analysed variables measured by the phi statistics indicates a clear relationship between information regarding the rating and the fluctuation of WIG20 index, ø = 0.65; $p < 0.01$. Following announcements from rating agencies regarding the decisions to downgrade a rating/outlook, or to sustain a negative perspective in subsequent periods, a decline or sustaining of the decreasing trend of the index were more often observed than an increase or sustaining an upward trend of the WIG20 index, which allows adopting the H3 hypothesis. On the other hand, following information about upgrading the rating/outlook or sustaining a positive perspective, a decrease or sustaining the downward trend in the WIG20 index was significantly more often observed, and thus the H4 hypothesis was confirmed (Figure 7).

In the case of the mWIG40 index, the test result shows a significant relationship between the rating information and the fluctuation of the index χ^2 (1 N = 18) = 7.48; $p < 0.01$ (Table 7).

The strength of the relationship between the analysed variables measured by the phi statistics indicates a clear relationship between the rating information and the fluctuation of the mWIG40 index, ø = 0.65; $p < 0.01$. Following announcements from rating agencies regarding the decisions to downgrade a rating/outlook, or to sustain a negative perspective in subsequent periods, a decline or sustaining of the decreasing trend of the index were more often observed than an increase or sustaining an upward trend of the mWIG40 index, which allows adopting the H5 hypothesis. On the other hand, following information about upgrading the rating/outlook or sustaining a positive perspective, a decrease or sustaining the downward trend in the mWIG40 index was significantly more often observed, and thus the H6 hypothesis was confirmed (Figure 8).

However, in the case of the sWIG80 index, the test result does not allow to determine a significant relationship between the information regarding the rating and the fluctuation of the sWIG80 index $\chi 2$ (1 N = 18) = 2.81; p = 0.094 (Table 8). Therefore, both the H7 and H8 hypotheses were rejected. The sWIG80 index applies to small enterprises, so it can be assumed that in the case of this group of companies there is less susceptibility to international agencies' assessments.

To sum up the results of the chi-square test, it was possible to state a significant relationship between the analysed variables for 3 of the 4 selected stock indexes: WIG, WIG20 and mWIG40, so the hypotheses H1–H6 have been confirmed. However, no significant relationship was identified between the information on Poland's sovereign rating and the sWIG80 index, which resulted in the rejection of the H7 and H8 hypotheses. It should be emphasized that the analyses carried out using cross tables refer to the group resulting from targeted selection, hence the chi-square analysis was supplemented by Fisher's exact test. This allows a more accurate assessment of the significance of the relationship in a situation where the number of cases for each index is less than 30.

5 Conclusions

Ratings affect the credibility of the country, its financial institutions and business entities. The downgrade is a disturbing signal for investors and may affect their financial decisions. The comparison of the stock exchange indexes of the Warsaw Stock Exchange against the decisions of rating agencies allowed to identify the impact of rating on the listed indexes. Information on

negative rating forecasts, as well as outlooks, coincided with the downward trend in the valuation of stock indexes, or confirmed the downward trend. On the other hand, some observations indicate the compliance of positive rating information from the agencies with the upward trend in the valuation of stock indexes or the rebound moment towards growth. Of course, it should be emphasized that information from rating agencies is only part of the factors affecting stock indexes. Nevertheless, fluctuations can be observed during the period of speculation on the forecast rating, as well as after the announcement of the final decisions.

At the same time, political information reaching rating agencies may also influence decisions and forecasts issued by analysts, which is reflected in the justifications for the decisions of rating agencies. Concerns about political changes, and consequently new social programmes, fiscal regulations and planned reforms are associated with uncertainty about the future economic situation, hence the tendency of analysts to underestimate ratings or rating outlooks. Consequently, these decisions may cause changes in financial markets and, as a result, lead to a real deterioration of the situation on the stock exchange. Despite the negative decisions of rating agencies in the analysed period, the Polish economy achieved good economic results, demonstrating upward trends, which prompted rating agencies to change their recommendations in 2018.

The trait that differentiates people is susceptibility to suggestion, which develops depending on the beliefs of a person, their experience, as well as the situational context and possible sanctions. Therefore, as part of the study of economic psychology, mechanisms affecting the process of making economic decisions are explained. Considering the impact of differences in risk perception and associated preferences, restrictions related to the processing of available information can also enrich economic and financial knowledge. Knowledge of natural mechanisms that affect decision-making, as well as the perception of intentional manipulations prompts a deeper analysis of available information. Despite striving for rational decision-making, we are influenced by many factors hindering and modifying information processing. The above considerations do not exhaust the entire range of factors affecting stock indexes, but allow us to see the significance of the impact of information provided by opinion-forming institutions. The research presented in the article is of an initiating one and will be continued in the long term.

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Appendix

Table 1
Sovereign ratings for Poland of agencies of the so-called Big Three in 2016

Foreign currency		**National currency**	
long-term	**short-term**	**long-term**	**short-term**
Standard and Poor's			
BBB+	A-2	A-	A-2
Moody's			
A2	P-1	A2	P-1
Fitch			
A-	F2	A-	F1

Source: own study based on www.bankier.pl, www.mf.gov.pl, accessed on: 20 May 2018.

Table 2
Date and type of rating agency decisions compared with the fluctuation of stock indexes in 2016

No.	Date of decision	Type of decision	Direction of the changes in the index chart			
			WIG	WIG20	mWIG40	sWIG80
1	15 January 2016	Polish rating downgrade by the Standard and Poor's rating agency for foreign and domestic currency, from A- to BBB + and A to A-, respectively. Change in outlook from stable to negative	↓	↓	↓	↓
2	14 May 2016	Moody's maintains its current rating, for foreign and domestic currency, at A2, but lowers the outlook from stable to negative	↓	↓	↓	↓
3	1 July 2016	Standard and Poor's maintains a lower rating for foreign and domestic currency, at BBB+ and A- levels, respectively, and a negative outlook	↓	↓	↓	↓
4	15 July 2016	Fitch Rating maintains Poland's high rating at A- and a stable outlook. In addition, it forecasts real GDP growth, a decrease in the budget deficit, and an increase in investment	↑	↑	↑	↑
5	9 September 2016	Moody's maintains a negative outlook	↓	↓	↓	↓
6	2 December 2016	Standard and Poor's raises the outlook from negative to stable	↑	↑	↑	↑

Source: own study based on www.bankier.pl, www.spratings.com, www.moodys.com, www.fitchratings.com, www.strefainwestorow.pl, accessed on 2 May 2018.

Table 3
Date and type of rating agency decisions compared with the fluctuation of stock indexes in 2017

No.	Date of decision	Type of decision	Direction of the changes in the index chart			
			WIG	WIG20	mWIG40	sWIG80
7	13 January 2017	Standard and Poor's maintains its downgraded rating and a stable outlook. Moody's maintains a high rating of A2, but confirms the negative outlook. Fitch Rating maintains Poland's high rating at A- and a stable outlook	↑	↑	↑	↑
8	21 April 2017	Standard and Poor's maintains ratings at the BBB+ level and a stable outlook. In addition, positive forecasts are announced, resulting from the observed economic growth, and a positive assessment of the independence of Narodowy Bank Polski	↑	↑	↑	↑
9	12 May 2017	Moody's maintains its rating for foreign and domestic currency at A2, and raises the outlook from negative to stable	↓	↓	↓	↓
10	7 July 2017	Fitch maintains previous ratings (the highest of the Big Three) at A-, for both foreign and domestic currency, and a stable outlook. The forecast of economic growth is raised	↑	↑	↑	↑
11	8 September 2017	Moody's maintains its rating for foreign and domestic currency at A2, and a stable outlook	↓	↓	↑	↓
12	20 October 2017	Standard and Poor's maintains its rating for foreign and domestic currency, at BBB+ and A- levels, respectively, and a stable outlook	↓	↓	↓	↓
13	8 December 2017	Fitch maintains its rating for foreign and domestic currency at A-, and a stable outlook	↑	↑	↓	↑

Source: own study based on www.bankier.pl, www.spratings.com, www.moodys.com, www.fitchratings.com, www.strefainwestorow.pl, accessed on 2 May 2018.

Table 4
Date and type of rating agency decisions compared with the fluctuation of stock indexes in 2018

No.	Date of decision	Type of decision	Direction of the changes in the index chart			
			WIG	WIG20	mWIG40	sWIG80
14	23 March 2018	Moody's maintains Poland's rating at a high A2 level, with a stable outlook, despite previous doubts about political issues in the country	↓	↓	↓	↓
15	3 April 2018	Standard and Poor's maintains a downgraded rating (BBB+ for long-term liabilities in the foreign currency), but raises the outlook from stable to positive	↑	↑	↓	↓
16	8 June 2018	The Fitch agency maintains its rating at A-, with a stable outlook	↓	↓	↓	↓
17	14 September 2018	Moody's maintains Poland's high rating (A2), with a stable outlook, and increases the forecast of economic growth from 4.4% to 5.0% of GDP	↑	↑	↑	↑
18	12 October 2018	Standard and Poor's raises its rating for Poland, from BBB+ to A-, and the rating outlook has been determined stable	↑	↑	↑	↓

Source: own study based on www.bankier.pl, www.spratings.com, www.moodys.com, www.fitchratings.com, www.strefainwestorow.pl, accessed on 10 December 2018.

Table 5
Chi-square test for the analysed variables in the case of the WIG index

	Value	df	Asymptotic significance (two-tailed)	Exact significance (two-tailed)	Exact significance (one-tailed)
Pearson's Chi-square	10.125	1	0.001**		
Correction for continuity	7.031	1	0.008**		
Fisher's exact test				0.004**	0.004**
N important observations	18				

*p < 0.05; **p < 0.01.

Table 6
Chi-square test for the analysed variables in the case of the WIG20 index

	Value	**df**	**Asymptotic significance (two-tailed)**	**Exact significance (two-tailed)**	**Exact significance (one-tailed)**
Pearson's Chi-square	7.481	1	0.006**		
Correction for continuity	4.938	1	0,026*		
Fisher's exact test				0,013*	0,013*
N important observations	18				

*p < 0.05; **p < 0.01

Table 7
Chi-square test for the analysed variables in the case of the mWIG40 index

	Value	**df**	**Asymptotic significance (two-tailed)**	**Exact significance (two-tailed)**	**Exact significance (one-tailed)**
Pearson's Chi-square	7.481	1	0.006**		
Correction for continuity	4.938	1	0,026*		
Fisher's exact test				0.013*	0.013*
N important observations	18				

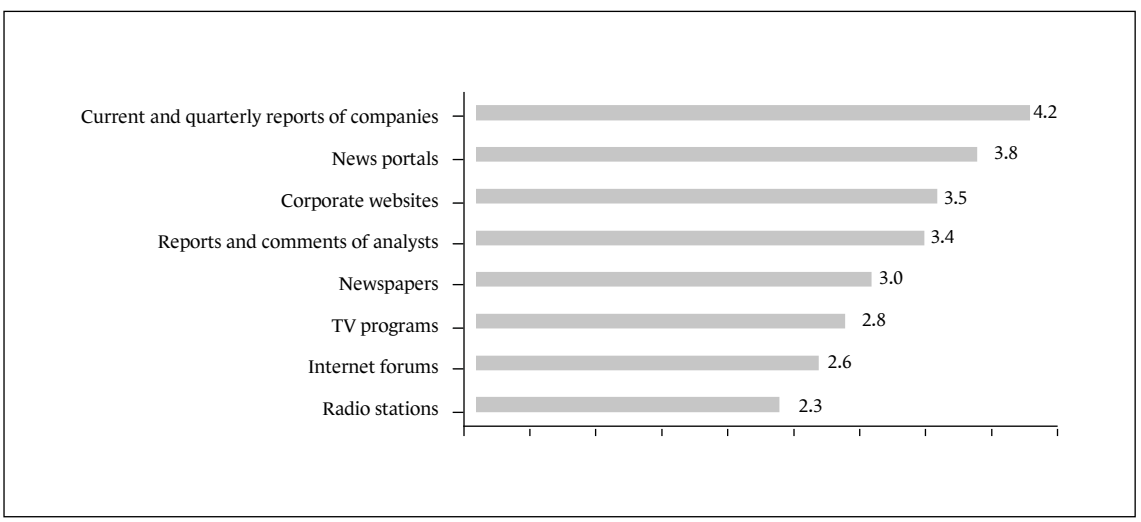
*p < 0.05; **p < 0.01.

Table 8
Chi-square test for the analysed variables in the case of the sWIG80 index

	Value	df	Asymptotic significance (two-tailed)	Exact significance (two-tailed)	Exact significance (one-tailed)
Pearson's Chi-square	2.813	1	0.094		
Correction for continuity	1.378	1	0.240		
Fisher's exact test				0.152	0.120
N important observations	18				

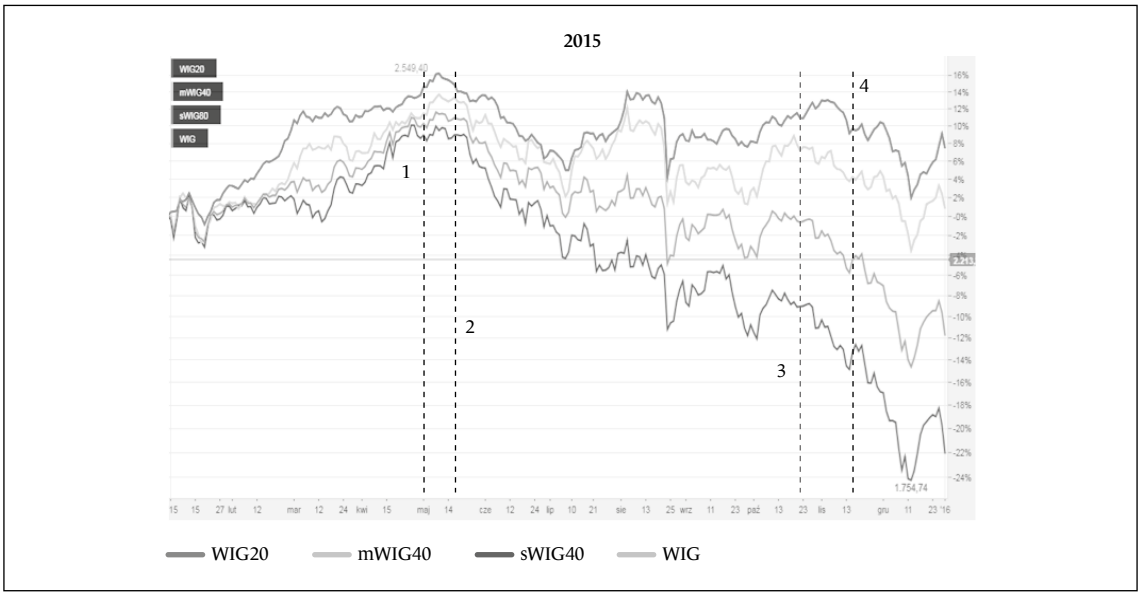
*p < 0.05; **p < 0.01.

Figure 1
Ranking of information sources as part of the Polish Investor Survey 2018 – from the most important (5) to the least important (1)



Source: www.sii.org.pl, access date: 19 December 2018.

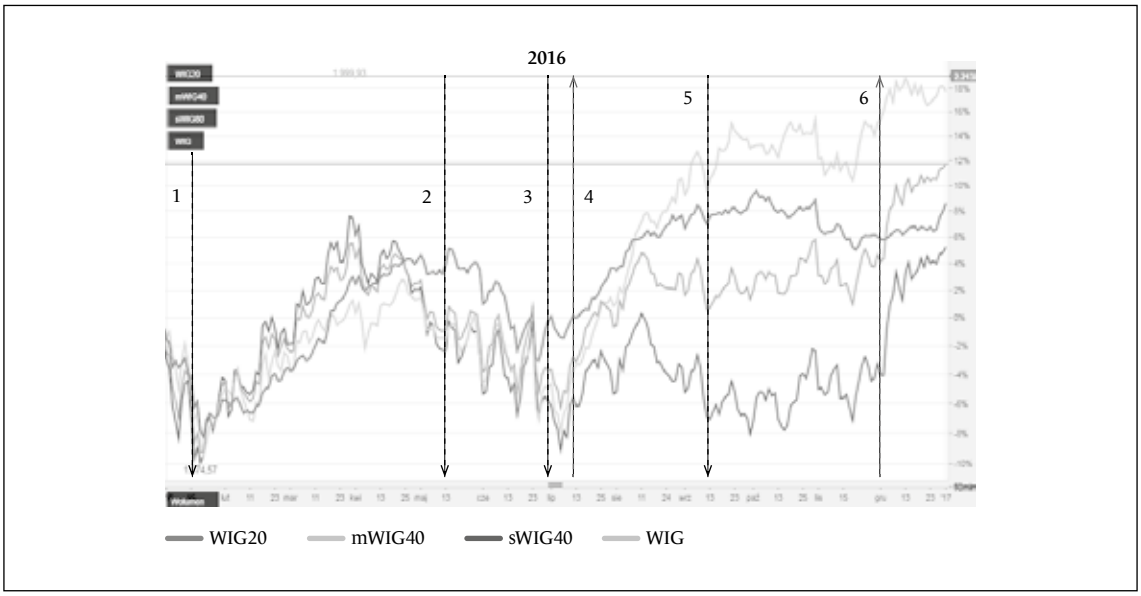
Figure 2
Comparison of WSE indexes in 2015 with dates of political events



Note: order of events 1 to 5.

Source: own study based on www.parkiet.com, accessed on: 20 May 2018.

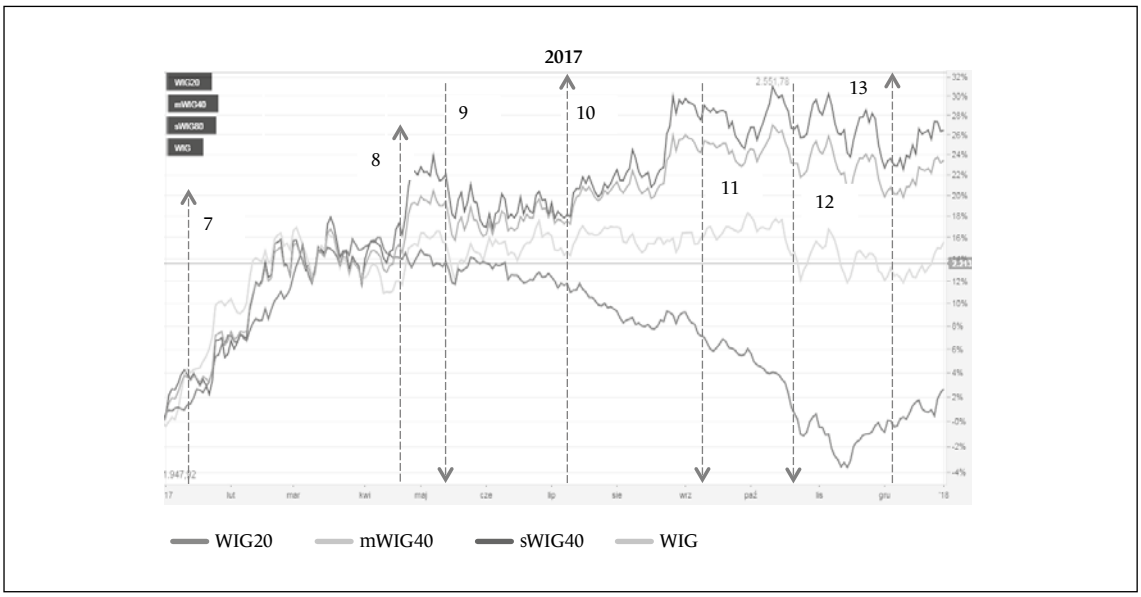
Figure 3
Comparison of WSE indexes in 2016 against the dates of rating agencies' decisions



Note: order of events 1 to 6.

Source: own study based on www.parkiet.com, accessed on: 2 May 2018.

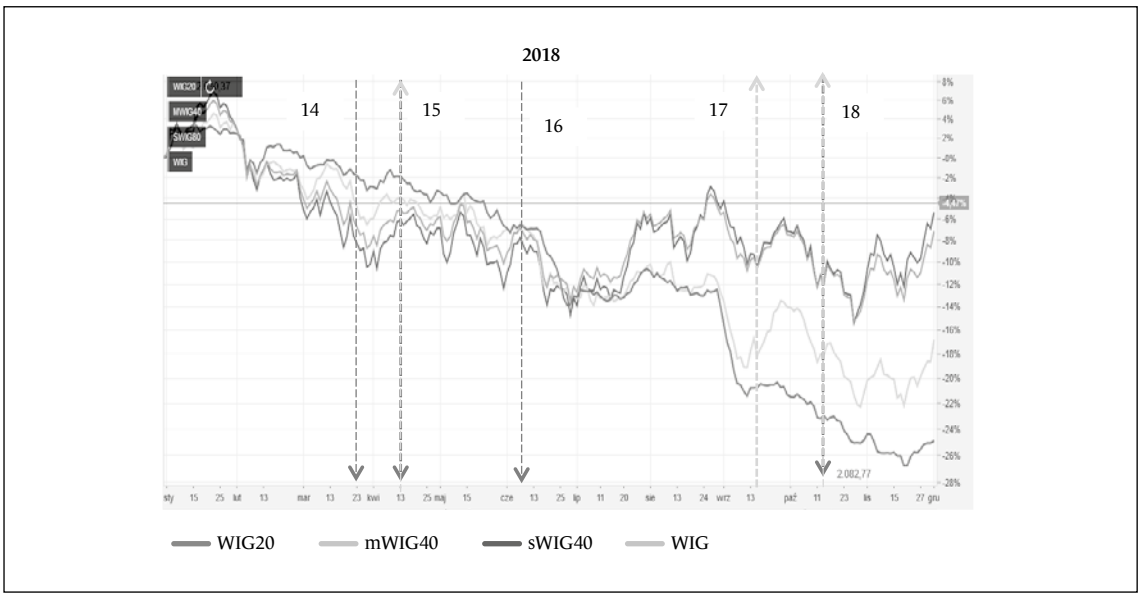
Figure 4
Comparison of WSE indexes in 2017 against the dates of rating agencies' decisions



Note: order of events 7 to 13.

Source: own study based on www.parkiet.com, accessed on: 2 May 2018.

Figure 5
Comparison of WSE indexes in 2018 with the dates of rating agencies' decisions



Note: order of events 14 to 18.

Source: own study based on parkiet.com accessed on 15 December 2018.

Figure 6
The relationship between the type of decision on Poland's sovereign rating and the WIG index

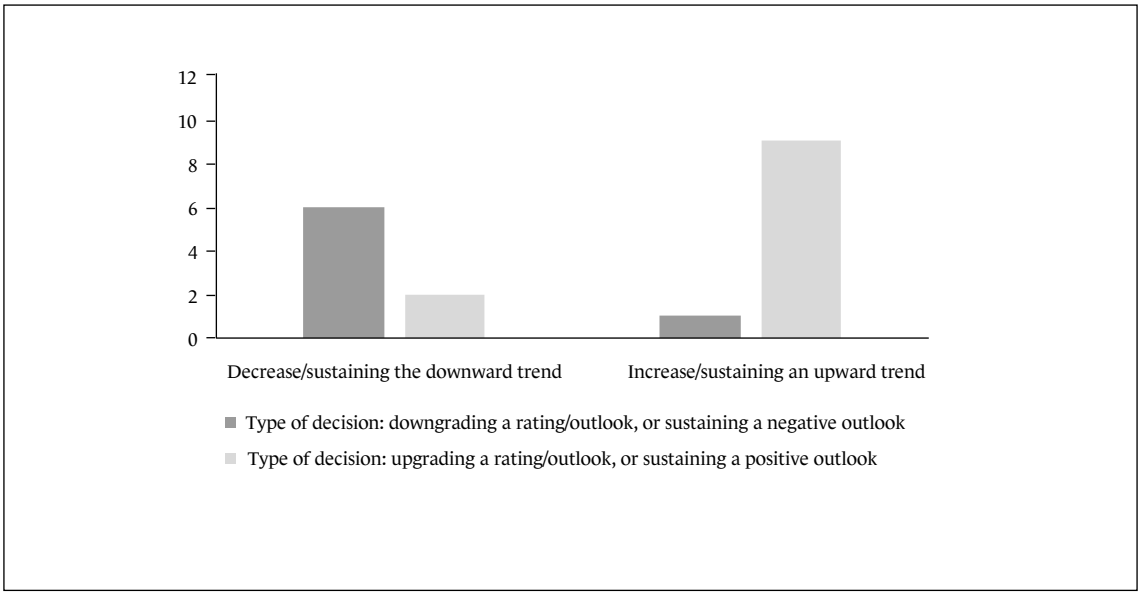


Figure 7
The relationship between the type of decision on Poland's sovereign rating and the WIG20 index

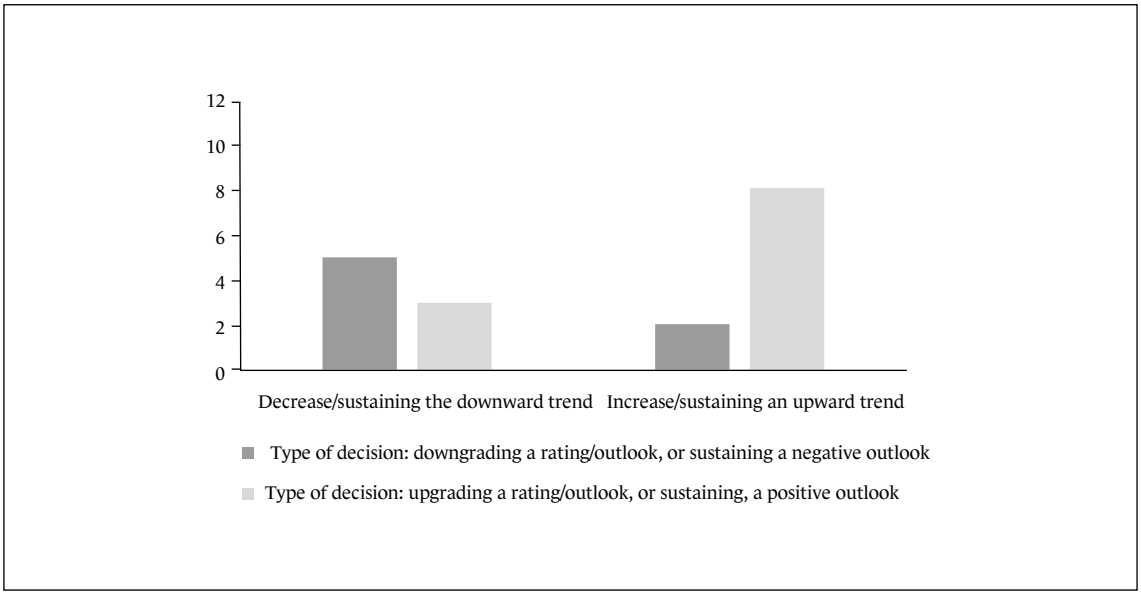
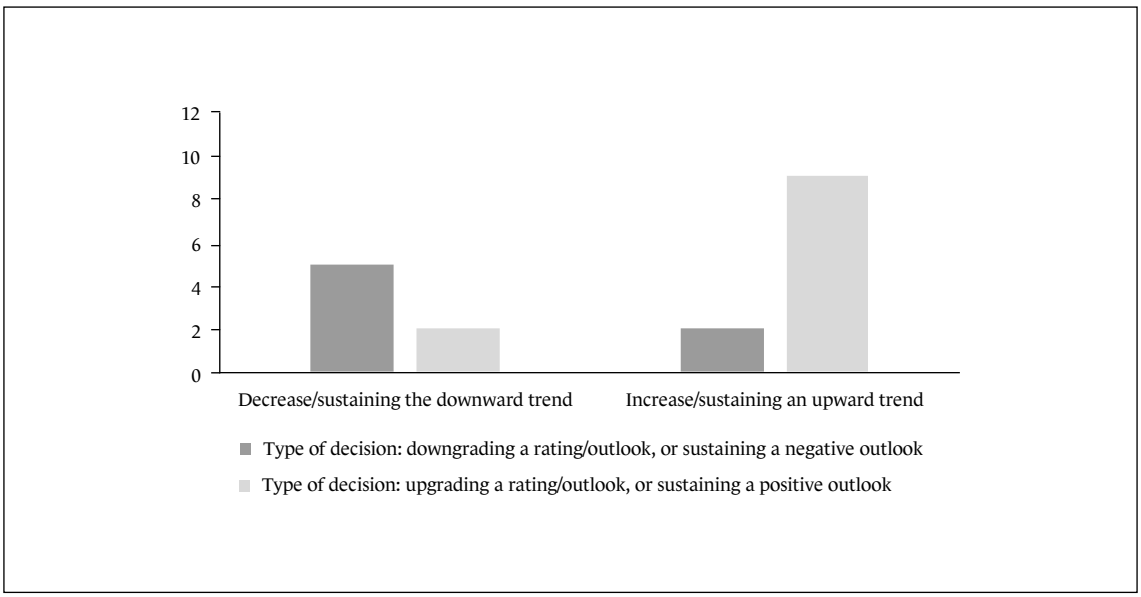


Figure 8
The relationship between the type of decision on Poland's sovereign rating and the mWIG40 index



Rola ocen ratingowych i innych informacji w kształtowaniu się indeksów giełdowych w Polsce

Streszczenie

Kluczowym elementem funkcjonowania rynków finansowych jest dysponowanie zbiorem informacji. Jednym z istotnych źródeł informacji są agencje ratingowe, a ich komunikaty traktowane są jako sygnał określający stopień zaufania względem danego podmiotu. Zarówno rating, jak i informacja dotycząca prognozowanej oceny ratingowej mogą prowadzić do istotnych zmian w decyzjach inwestycyjnych, a w rezultacie wpływać na kształtowanie się notowań indeksów giełdowych. Podejmowanie decyzji inwestycyjnych wiąże się z niepewnością co do ich skutków, a w rezultacie z ryzykiem poniesienia strat. Presja czasu, presja zysków, awersja wobec strat to czynniki, które istotnie zaburzają racjonalne analizowanie informacji. Analiza danych finansowych może okazać się niewystarczająca dla inwestora, co należy rozpatrywać z dwóch perspektyw. Z jednej strony informacje dodatkowe, pochodzące z różnych źródeł, mogą zwrócić uwagę na aspekty nieporuszane w raportach okresowych i rocznych. Czynnik nieistotny z punktu widzenia zasad sporządzania i prezentowania raportów może okazać się przeważający w danej sytuacji, a na jego podstawie zostanie zmieniona lub podjęta decyzja. Z drugiej strony to zachowanie ludzkie kształtuje zmiany na giełdzie. Pomimo bardzo dobrej sytuacji finansowej i perspektyw rozwoju informacja obciążająca wizerunek podmiotu, uzasadniona czy nie, może drastycznie zmienić notowania spółki. Znajomość mechanizmów mających wpływ na podejmowanie decyzji, występujących w sposób naturalny, jak również dostrzeganie celowych manipulacji skłaniają do głębszej analizy dostępnych informacji. Wymienione przesłanki pozwoliły na przyjęcie założenia, że na podejmowanie decyzji inwestycyjnych, a w konsekwencji na kształtowanie się indeksów giełdowych istotny wpływ mają komunikaty agencji ratingowych i inne informacje o charakterze makroekonomicznym.

Celem artykułu jest identyfikacja roli ocen ratingowych i innych informacji w kształtowaniu się indeksów giełdowych w Polsce. Przedmiotem badań było porównanie terminów decyzji agencji ratingowych dotyczących Polski i innych informacji z kształtowaniem się notowań wybranych indeksów giełdowych Giełdy Papierów Wartościowych w Warszawie. Obserwacja informacji dotyczących zmian politycznych i gospodarczych w Polsce, przekazywanych przez media w latach 2015–2018, była inspiracją do dokonania przeglądu decyzji w sprawie ratingu Polski w tych latach. Założono, że w okresie oscylującym wokół daty planowanego przeglądu ratingowego zauważalne będą zmiany w notowaniach wybranych indeksów. Terminy poszczególnych decyzji w sprawie ocen ratingowych Polski porównano z notowaniami głównych indeksów giełdowych GPW w Warszawie – WIG, WIG20, mWIG40 oraz sWIG80.

Porównanie kształtowania się indeksów giełdowych GPW w Warszawie z decyzjami agencji ratingowych pozwoliło zidentyfikować wpływ ocen ratingowych na notowania wymienio-

nych indeksów. Negatywne informacje dotyczące prognoz obniżenia ocen ratingowych oraz ich perspektywy pokrywały się z momentem zmiany kierunku notowań na spadkowy lub umocnieniem tendencji malejącej notowań indeksów giełdowych. Część obserwacji wskazuje natomiast na występowanie zgodności pozytywnych informacji agencji ratingowych z tendencją wzrostową notowań indeksów giełdowych lub momentem odbicia w kierunku wzrostu. Mimo negatywnych decyzji agencji ratingowych w analizowanym okresie Polska gospodarka osiągała dobre wyniki ekonomiczne, wykazując tendencje wzrostowe, co skłoniło agencje ratingowe do zmiany rekomendacji w 2018 r. Oczywiście należy podkreślić, że informacje płynące od agencji ratingowych stanowią jedynie część czynników mających wpływ na notowania indeksów giełdowych. Niemniej jednak można zaobserwować wahania notowań w okresie spekulacji na temat prognozowanego ratingu, jak również po opublikowaniu ostatecznych decyzji. Informacje polityczne docierające do agencji ratingowych mogą mieć również wpływ na decyzje i prognozy wydawane przez analityków, co jest widoczne w uzasadnieniach decyzji agencji ratingowych. Podatność na sugestie jest cechą różnicującą ludzi, kształtuje się ona w zależności od przekonań człowieka, jego doświadczenia, jak również kontekstu sytuacyjnego i ewentualnych sankcji. Obawy związane ze zmianami politycznymi, a w następstwie z nowymi programami socjalnymi, regulacjami fiskalnymi i planowanymi reformami wiążą się z niepewnością co do przyszłej sytuacji gospodarczej, stąd też skłonność analityków do zaniżania ocen ratingowych lub perspektyw ratingowych. W konsekwencji decyzje te mogą powodować zmiany na rynkach finansowych, a w efekcie prowadzić do rzeczywistego pogorszenia sytuacji na giełdzie.

Podjęte w artykule rozważania nie wyczerpują całego zakresu czynników mających wpływ na notowania indeksów giełdowych, ale pozwalają dostrzec znaczenie oddziaływania informacji przekazywanych przez instytucje opiniotwórcze. Badania przedstawione w artykule mają charakter inicjujący i będą kontynuowane w dłuższej perspektywie czasowej.