

ANALYSIS OF THE RATES OF RETURN ON INVESTMENTS IN SOCIALLY RESPONSIBLE COMPANIES WITH THE EXAMPLE OF THE WIG-ESG INDEX

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Abstract

Research background: The ecological transformation has contributed to the increased importance of socially responsible investments. In the theoretical part of the paper, the issues of CSR and ESG were mentioned, and a literature review was performed. The empirical part presents the results of the analysis of the rates of return on WIG-ESG companies in the period from January 1, 2019 to April 30, 2023.

Purpose: The aim of the paper is to verify whether investing in shares of socially responsible companies included in the WIG-ESG index bring higher rates of return than investing in companies not included in this index.

Research methodology: The paper is to compare the cumulative rates of return on investments in the shares of companies included in the WIG-ESG index with the rates of return on investments in the shares of companies not included in the WIG-ESG index. The comparison was made for the sectors represented by the companies in the WIG-ESG index.

Results: The obtained results indicate that investing in the shares of companies which are considered socially responsible allows to achieve higher rates of return than in sector indexes and broad business sectors.

Novelty: The study is concerned with a comparative analysis of the cumulative rates of return in the WIG-ESG companies – which have been grouped into sectors – and on non ESG – oriented companies. This

approach allowed to draw conclusions specific to the research period covering the COVID-19 pandemic and the outbreak of the war in Ukraine.

Keywords: WIG-ESG, social responsibility, investments, rates of return, stock exchange

JEL classification: F64, G11, G12, P56

Introduction

The ecological transformation carried out in the European Union over recent years has contributed to the increased importance of issues related to the concept of ESG (*environment, social, governance*). This concept means the implementation of environmental, social and corporate governance principles by companies, as well as a change in the way their business activities are analyzed and evaluated (Amel-Zadeh, Serafeim, 2018). The assessment of companies is no longer based only on the economic calculation but considers also their results relating to environmental and social activities and management methods.

The history of ESG reflects the evolution of business approaches to environmental, social and corporate governance issues. It is worth tracing the evolution of the ESG concept over the years. The genesis of the ESG concept is presented in Figure 1.

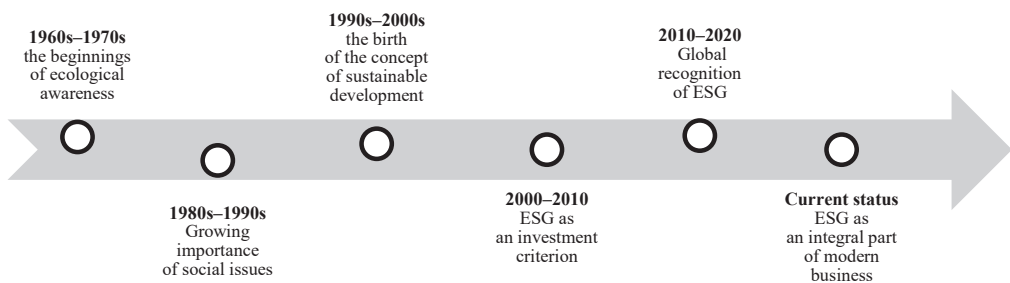


Figure 1. The origins of the ESG concept

Source: own elaboration based on <https://fips.pl/co-to-jest-esg-i-dlaczego-staje-sie-wymogiem-wspolczesnego-biznesu>.

The first manifestations of ecological awareness could have already been seen in the 1960s (Ślazińska-Kluczek, Brzezek, 2023). At that time, among others, the book “*Silent Spring*”

by R. Carson was published, in which the author drew reader's attention to the degradation of the environment caused by human activity. In the 1980s and 1990s social issues such as human rights and social justice began to gain popularity, which became the subject of interest of an increasing number of non-governmental organizations. An important event from the point of view of the ESG concept was the United Nations Conference in Rio de Janeiro, where in 1992 a global movement for sustainable development was initiated and the concept was adopted according to which sustainable business should balance ecological and social aspects in addition to economic aspects. The beginning of the 21st century was a period of popularization of the ESG concept in the world of finance, among others through the inclusion of ESG criteria in investment strategies by institutional investors and investment funds. In the decade 2010–2020, ESG gained popularity on a global scale, and is now increasingly becoming a permanent element of business strategy (Fips, 2024).

The development of ESG in Poland and worldwide is mainly determined by regulations aimed at supporting a sustainable economy. The most important supranational regulations include:

1. The 2015 Paris Agreement, which focuses on climate goals and their reporting.
2. The CSRD Directive and the European Sustainability Reporting Standards (ESRS), which aim to unify ESG reporting standards across Europe.
3. The 2030 Agenda for Sustainable Development, a global UN initiative covering the 17 Sustainable Development Goals (Gołębiewski, 2023).

From Poland's perspective it seems important to implement the EU CSRD directive. The implementation process is currently underway and companies will have to adapt to the new requirements by 2027. Institutions such as the Warsaw Stock Exchange, which has developed guidelines for ESG reporting to help companies identify and manage ESG-related risks and opportunities (GPW 2, 2024), and the Polish Financial Supervision Authority, which issues recommendations on the issue of financing sustainable development (KNF, 2024), are also involved in promoting ESG solutions.

The introduced obligations for companies to report information about the applied ESG principles may affect many areas of their business operations, including the mechanism for making strategic financial decisions. Gaining or strengthening a competitive advantage may require to obtain and execute projects that bring clear environmental and social effects.

Implementing the ESG concept in a company has both advantages and disadvantages. The advantages include: improving the company's reputation (Misztal, 2023), and thus increasing its investment attractiveness (Ślazińska-Kluczek, Brzezek, 2023), reducing risks

through appropriate risk management (Kubala, 2023), and increasing employee engagement and loyalty (KPMG, 2024). The disadvantages of the ESG concept mentioned in the literature include: high implementation costs (Misztal, 2023), the need for comprehensive reporting (Ślażyńska-Kluczek, Brzezek, 2023) and the risk of greenwashing (Kubala, 2023), i.e. a situation in which a given company presents itself as more sustainable than it actually is, which may consequently lead to a loss of consumers' and investors' trust.

Over recent years issues related to ESG have been eagerly discussed in the literature. The results of bibliometric research conducted by G. Wan, A.Y. Dawod, S. Chanaim and S.S. Ramasamy indicate a growing number of publications in the years 2004–2021 (Wan, Dawod, Chanaim, Ramasamy, 2023). Particular growth occurred in the years 2016–2021. The total number of ESG publications in this period was 675, which indicates that the ESG concept has attracted a lot of academic attention. The authors have performed a keyword analysis which has let them divide the main topics of the research into five aspects: *the philosophy of the ESG system*, *factors affecting ESG*, *the financial outcomes of ESG*, *the association between ESG and CSR*, and *ESG investing*. The keywords for investing into ESG include mainly portfolio theory and portfolio construction. The application of ESG principles and the issue of ESG investing also draws attention to the concept of SRI (*socially responsible investing*). By definition SRI investors pursue not only financial goals, but also non-financial goals (Osthoff, 2008). M. Statman wrote that socially responsible investments “*mix the utilitarian features of money with the value-expressive features of social responsibility*” (Statman, 2000). Investments which are considered socially responsible need to contribute to achieving certain social effects. For this reason, investors who allocate their financial resources in a socially responsible manner, prefer entities that comply with the principles of conducting responsible business activities, mainly those relating to environmental, social and corporate governance issues. At the same time, however, it should be emphasized that investors' financial decisions are carried out not only with the sole aim of obtaining social effects but are also intended to maximize profits. As W. Rogowski and A. Ulianiuk note, social investing does not contradict the essence of traditional investing (Rogowski, Ulianiuk, 2012). Moreover, it can be assumed that investors who engage their financial resources in ESG and SRI – oriented companies, can expect higher rates of return on these investments. The rate of return is the basic measure of the effectiveness of financial investments and is an integral part of the definition of investing. Therefore, it is reasonable to consider the issue of the effectiveness of investing in ESG listed companies in Poland in this work. For the purposes of further analysis, a following hypothesis was formulated: investing in companies of the sectors from the WIG-ESG index allowed to

achieve higher rates of return than in corresponding sector indexes or broad business sectors in the years 2019–2023.

1. Literature review

Up to now, the literature debate mainly concentrates on whether SRI indices and SRI funds are more profitable than conventional financial investments. According to C. Revelli and J.L. Viviani no real consensus has been reached, as many studies have shown a negative, positive or neutral relationship between SRI and financial performance (Revelli, Viviani, 2015). This ambiguity on the performance of SRI remains therefore an open challenge. A.K. Blankenberg and J.F.A. Gottschalk also state that the relationship between sustainable business models and financial performance has still not been fully understood (Blankenberg, Gottschalk, 2018). The authors in their research constructed and compared two portfolios, the green one and the conventional one, covering the time period of 2002–2016. The green portfolio included 20 different stocks from 11 different countries and various business sectors: IT, Banking, Pharmaceuticals, Organic Food, Machinery, Water Treatment, Photovoltaics, Wind Energy. These sectors have been taken into account to represent different aspects of sustainability. The reference portfolio also included 20 stocks which came from 10 different countries. These however represented more conventional business sectors such as chemicals, mining, car producers, gas and oil production or pharmaceuticals. The authors found that a sustainable portfolio did not perform significantly different than a conventional one. In other words, the sustainable criteria could be used in the investment strategies without a negative effect on the returns. B.R. Auer and F. Schuhmacher write that while the issue of the non-financial utility of SRI is undisputed, there is still the question of the potential economic viability of SRI (Auer, Schuhmacher, 2015). The authors analyzed the performance of socially responsible investments in the Asia-Pacific region, the United States and Europe. The results of their research indicate that in Europe, investors pay a price for socially responsible investing while in the Asia-Pacific region and the US, ESG oriented investors achieve similar performances to the broad market. L. Hornuf and G. Yüksel claim that on average, SRI neither outperforms nor underperforms the market benchmarks (Hornuf, Yüksel, 2022). The overall findings of studies on the link between SRI and returns suggest that the returns for investing in the SRI portfolio are not significantly different from returns in a conventional portfolio. Positive findings are however also evident in the literature. J.F.T. Diaz found that ethical firms on average have lower volatility and higher returns than their non-ethical counterparts (Diaz, 2016). The author

explains these results by the existence of the general positive market perception on ethical companies, which leads to the inflow of capital. An unfavorable perception is on the other hand the reason for the exodus of capital. The opposite view may be found in the paper presented by S. Brammer, C. Brooks and S. Pavelin (2006). The authors investigated the relationship between corporate social performance and financial performance, using stock returns for a sample of UK quoted companies. The results show that firms with corporate social performance scores tend to achieve lower returns, while firms with the lowest possible corporate social performance (scores of zero) achieved higher returns than the market. The differences in returns of portfolios between the socially responsible companies and the socially reprehensible companies were so great that, according to the authors, they could not be explained by the standard risk-based models. They could only be clarified by the behavioral aspects of the decision-making process. We will present one of them. Researchers indicate that some institutional or altruistic shareholders may be willing to forgo their profits in order to feel morally at ease with the stock they have in their portfolio, which as a consequence leads to lower requested returns on the stocks of socially responsible firms.

The issue of social investing was also discussed in the domestic literature. K. Wróblewska in her work described the social responsibility index – RESPECT, which was the first index of this type in Central and Eastern Europe (Wróblewska, 2014). The paper defines the goals for which responsible indexes are created and the existing relationships between corporate social responsibility (CSR) and ESG. The author emphasizes that responsible indexes are created to set a benchmark for firms conducting CSR activities and at the same time they constitute a reference for investors whose investment decisions are based on ESG criteria. The study of H. Sikacz and P. Wolczek (2017) was concerned with the analysis of non-financial data related to environmental issues, social responsibility and corporate governance. Based on the results obtained, the authors formulated a proposal to modify the procedure of creating the RESPECT index composition. It was noticed that the procedure for classifying companies into the index was carried out without the data presented in the international databases. The authors stated that it is recommended that stakeholders reach for additional sources of information to assess companies in terms of the application of ESG principles. According to the authors, a useful source of information for both professionals, businesses and researchers could be the ASSET4 ESG database signed by Thomson Reuters EIKON. This approach may help investors to remove doubts and uncertainties in their investment decisions.

M. Wolska and M. Czerwonka performed a comparison between four open investment SRI funds operating on the Polish capital market, which have been using various socially

responsible investment strategies and the stock exchange index – RESPECT index (Wolska, Czerwinka, 2013). In order to measure the funds' performance, simple rates of return, the Sharpe ratio and the Treynor ratio were used. The funds which have been analyzed were: "SKOK SFIO Etyczny 1", "SKOK SFIO Etyczny 2", "Investor Zmian Klimatycznych" and "Subfundusz PZU Energia, Medycyna, Ekologia". The rates of return were calculated based on the closing prices of the index for the period from December 2009 to December 2011. The research did not allow to obtain a clear statement on the profitability of investments in products related to the SRI concept. Three of the four funds considered in the research achieved worse results than the market portfolio. As noted in this paper, the main reason for this could be the short period of the research, as well as the unfavorable general atmosphere prevailing on the financial market at that time.

A. Duliniec notes that the key factor determining the development of socially responsible investments is the assessment of the profitability of investments based on the SRI concept and then the comparison of the profitability between these investments and other not SRI-focused investments (Duliniec, 2015). The author points out that the conclusions from this type of research are not unambiguous. Some managers of ethical and socially responsible funds believe that investing in ethical companies brings higher rates of return in the longer term, while others take a completely different view. The author also refers to the results of a study that was conducted for approximately one hundred ethical funds and conventional funds operating in Germany, Great Britain and the United States in the years 1990–2001. These studies did not show any significant differences in the average rates of return generated by ethical funds and conventional funds.

The effectiveness of socially responsible investments was the subject of the research conducted by A. Lulewicz-Sas (2014). In this work a comparative analysis of the rates of return from the RESPECT Index and from the WIG 20 index in the period from January 2009 to December 2013 was conducted. The average daily logarithmic rate of return was used to measure the income earned from holding each of the portfolios considered, and the standard deviation of rates of return was used to describe the investment risk. In order to conduct a combined analysis of the rate of return and risk and to ensure the comparability of results, the author used the Sharpe ratio. Based on the performed research, it was found that the average rate of return on the index of shares of socially responsible companies was higher than the average rate of return on investments in the WIG20 index shares portfolio. Both analyzed portfolios were characterized by a similar level of risk, but the portfolio of shares of companies included in the RESPECT index guaranteed investors a higher premium for a beared risk.

D. Jędrzejka verified whether investing in entities disclosing information in the ESG area translates into higher rates of return (Jędrzejka, 2014). The study examined, among other things, the correlation of ESG assessment with the simple rate of return of companies listed on the WSE on 30 June 2012 and on 30 June 2013. These companies were assigned ratings regarding the results of their activities in the environmental, social and corporate governance sides. The rates of return were calculated for three annual periods, namely year 2011, year 2012 and at the end of June 2013. Based on the results obtained, it was found that shares of companies which were ESG-oriented and informed investors about the results achieved in this area, generated higher rates of return.

Companies from both the RESPECT index and WIG-ESG index were taken into consideration in the study by A. Kłysik-Uryszek (2020). In this paper the author was seeking an answer to the question of how the application of CSR principles by companies translates into the rates of return on their shares and the investment risk. Various research methods have been applied in this paper, including excess rate of return, the beta coefficient, Treynor ratio and Sharpe ratio. It turned out that during the research period covering the years 2017–2019, the values of the excess rate of return for companies complying with CSR principles and for companies not following these principles in their activities were similar. However, a portfolio which consisted of non ESG-focused companies brought a higher rate of return over a period of one year.

Scientific papers dealing with the issue of socially responsible investing on the Polish financial market can therefore be divided into those focusing on presenting the general concept of socially responsible investing and those presenting the results of an empirical analysis of the profitability of financial investments in traditional portfolios and the portfolios of ESG-oriented and CSR-oriented companies. Based on the results presented in the literature, it is difficult to clearly indicate that investing in socially responsible companies guarantees investors higher rates of return compared to traditional investments. Although the issue of investing in ESG-oriented companies on the Polish capital market has been held by different authors, there was no synthetic study presenting an analysis of the rates of return on the companies from the WIG ESG index, which have been grouped into business sectors, representing different aspects of sustainability. This paper fills the identified research gap and may bring a new perspective to the issue of investing in socially responsible companies on the Polish capital market.

2. Characteristics of the WIG-ESG index

Financial markets play a unique role in promoting socially responsible investing. In Poland, this task is fulfilled by the GPW (Warsaw Stock Exchange) Capital Group, which is the most important institution on the capital and commodity market. On its website, the GPW Group indicates that its activities take into account environmental, social and ethical issues. This attitude is reflected in the adoption of the GPW Capital Group's ESG Strategy 2025 for the years 2022–2025. This document presents the main directions of activities that are intended to ensure harmony between the implementation of business goals and ESG factors. The directions of the ESG Strategy are based on three pillars, which are presented below in Figure 2.

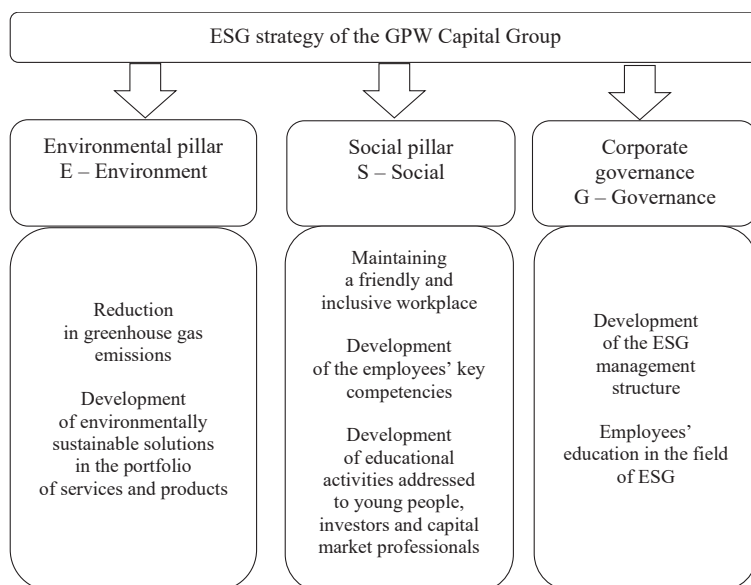


Figure 2. ESG strategy of the GPW Capital Group 2025 for the years 2022–2025

Source: own elaboration.

It should be underlined that in addition to conducting its business in a sustainable manner, the GPW Group also offers to investors a number of ESG related financial products. In this context, it is worth paying attention to the WIG-ESG index, that has been calculated since September 3, 2019 and which replaced the previously published RESPECT Index.¹ The base value of the

¹ The RESPECT Index was published in the period from November 19, 2009 to January 1, 2020.

index was established on December 28, 2018 at the level of 10,000.00 points. The index is based on the values of listed companies which are considered as socially responsible. Companies in the WIG-ESG index need to comply with principles of socially responsible business, in particular in the field of environmental, social, economic and corporate governance issues.

The weights of companies in the WIG-ESG index depend on the number of free-float shares adjusted by the ESG ranking results and the assessment of the application of corporate governance principles. The ranking is prepared by “Sustainalytics” which is one of the leading independent ESG analytic firms. Scoring is based on the information from the companies’ annual reports, as well as non-financial reports and information published on their websites. The assessment of ESG risk involves measuring the exposure of a given sector to ESG risks and verifying the way they are managed by particular companies. The shares of companies in the WIG-ESG index also depend on the assessment of the application of corporate governance principles, which are included in the “Best Practices of Listed Companies 2021”. It should be noted that the share of the largest companies is limited to the numbers resulting from the 5/10/40 rule. This rule means that the weight of an individual company in the index portfolio cannot exceed 10%, while the total share of companies, each of which exceeds 5%, is limited to 40%. Key information about the WIG-ESG index can be seen in Table 1.

Table 1. Key information about the WIG-ESG index

Base date	28.12.2018
Base capitalization (PLN)	188,333,304,100.00
Base value	10,000.00
The number of participants	variable
Maximum share in the index	10% for the company and 40% for companies >5%
Publication of the index	continuous
Opening value	09:00
Current values	every 60 seconds

Source: own elaboration.

It should be also added that the WIG-ESG is a total return index and thus when it is calculated it accounts both the prices of underlying shares and dividend income. The index is calculated continuously at 60-second intervals.

3. Research methodology

The aim of the research was to compare the cumulative rates of return on companies included in the WIG-ESG index and grouped into sectors with the corresponding cumulative rates of return from sector indexes. In case there was no specific sector index for a given company, an average cumulative rate of return for all companies listed on the Warsaw Stock Exchange operating in a particular sector have been calculated. Despite the lack of specific sector indices, a comparison with the average results of other companies in the same sector provides valuable information on the relative performance of companies included in the WIG-ESG index (Purczyński, Bednarz-Okrzyńska 2015). The study used cumulative rates of return to obtain a comparability of results to the classic “buy and hold” strategy, which in the literature is very often considered a basic strategy compared to active investment strategies (Fierla, 2020). The research was conducted on the basis of data covering the period since the WIG-ESG index was set, i.e. from January 1, 2019 to April 30, 2023. The research period includes three sub-periods characterized by different stock price volatility: from January 1, 2019 to March 19, 2020 (period before the COVID-19 pandemic); from March 20, 2020 to February 22, 2022 (period starting with the introduction of the state of the COVID-19 pandemic in Poland and ending with the outbreak of the war in Ukraine) and from February 23, 2022 to April 30, 2023 (period covering both the COVID-19 pandemic and the war in Ukraine). The structure of the WIG-ESG index was described based on the information available from the website of the Warsaw Stock Exchange WIG-ESG Index Card, (2023).

The research was carried out according to a procedure that consists of the following stages:

1. Identification of the business sectors represented by the companies included in the WIG-ESG index at 30.04.2023 and then the assignment of the companies to particular sectors.
2. Analysis of the structure of the WIG-ESG index, taking into account the percentage shares of sectors in the market capitalization of the whole index at 30.04.2023.
3. Analysis of the structure of the WIG-ESG index, taking into account the number of companies within the particular sectors at 30.04.2023.
4. Calculation of average cumulative rates of return on the companies from the WIG-ESG index – grouped into sectors – and on the whole WIG-ESG index.

5. Calculation of average cumulative rates of return on existing sector indexes. In case there was no specific sector index, the average cumulative rate of return on the broad business sector has been calculated.
6. Comparison between the average cumulative rates of return on WIG-ESG companies – grouped into sectors – and average cumulative rates of return on sector indexes or broad business sectors. The aim of the comparison was to check whether investing in socially responsible companies can be more profitable for an investor than investing in the broad market.

The cumulative rates of return were calculated based on the values of daily closing shares' prices and daily closing index prices by adding up the values of previously calculated simple rates of return. Cumulative rates of return on broad business sectors have been calculated for all of the WSE listed companies representing particular sectors. The data used for the calculations comes from the website www.stooq.pl.

4. Results

The WIG-ESG index consists of 60 companies which represent 28 different business sectors. The percentage shares of companies from particular sectors in the market capitalization of the WIG-ESG index at 30.04.2023 are shown in Figure 3.

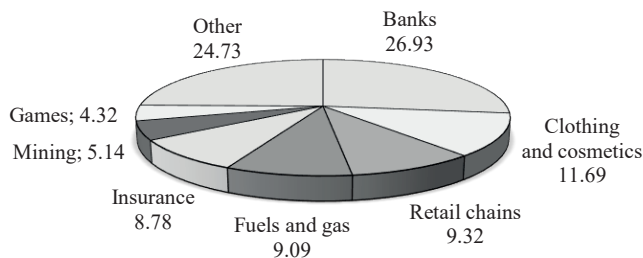


Figure 3. Percentage shares of companies from different business sectors in the market capitalization of the WIG-ESG index at 30.04.2023

Source: own elaboration.

Analysis of the data in this figure indicates that the largest percentage share in the WIG-ESG index – over one quarter – are banks (26.93%). This sector also includes the company with the largest single percentage share in the entire index – PKO BP SA (9.63%). The second largest share in the WIG-ESG index according to market capitalization is the clothing and

cosmetics sector (11.69%). Further in this classification are retail chains (9.32%), fuels and gas (9.09%), insurance (8.78%), mining (5.14%) and games (4.32%). The share of companies representing other sectors in the WIG-ESG index does not exceed 4%. It is worth noting that the share of particular sectors in the index does not always correspond to the number of companies. An example here is the fuel and gas sector, which has a share in the index of 9.09%, and at the same time it consists of only one company – PKN Orlen SA. Therefore, it seems interesting to extend the analysis and consider the number of companies representing particular sectors in the WIG-ESG index. Figure 4 presents all the business sectors in the index at 30.04.2023.

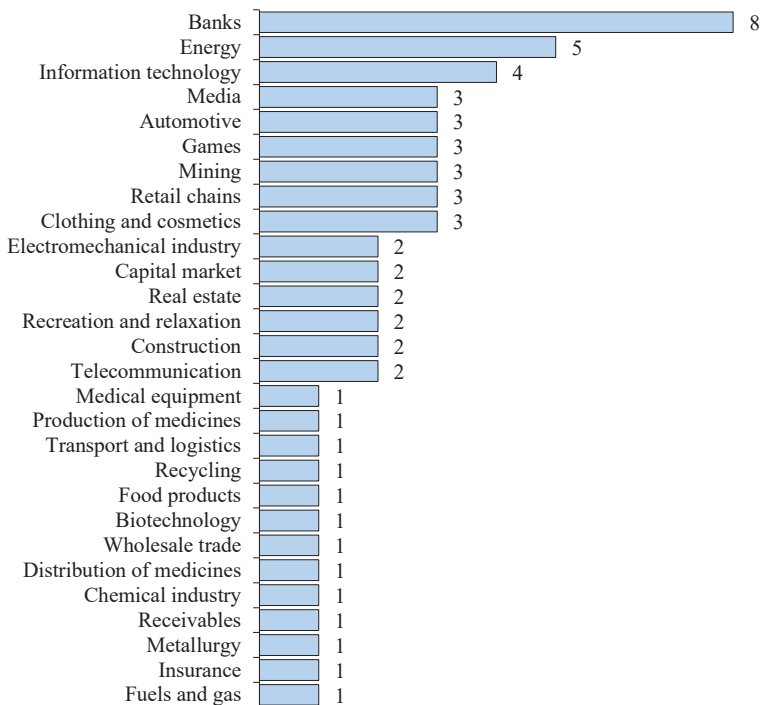


Figure 4. The number of companies in the WIG-ESG index representing particular sectors

Source: own elaboration.

As mentioned before, the WIG-ESG index consists in total of 60 companies. The largest group are companies from the banking sector – there are eight of them. The index also includes, among others: five companies from the energy sector and four from the information technology sector. The other sectors are represented by three or less than three companies. It should be

noted that, although there are many companies operating in the energy sector and in the information technology sector, they represent small shares in the capitalization of the WIG-ESG index, which are 3.02% and 2.8% respectively.

Daily rates of return were calculated based on the prices of individual companies included in the WIG-ESG index, and then by adding them up, cumulative rates on particular sectors were obtained. These rates of return as well as the cumulative rate of return on the whole WIG-ESG index are presented below in Table 2.

Table 2. Cumulative rates of return on WIG-ESG sectors and cumulative rate of return on the whole WIG-ESG index in the period from January 2019 to April 2023

No.	Industry	Cumulative rate of return (%)	No.	Industry	Cumulative rate of return (%)
1	Wholesale trade	355.51	15	Mining	73.61
2	Medical equipment	309.72	16	Media	64.23
3	Recycling	274.14	17	Recreation and leisure	63.50
4	Biotechnology	196.26	18	Chemical industry	55.62
5	Capital market	190.74	19	Energy	46.40
6	Construction	166.06	20	Telecommunication	40.18
7	Receivables	148.18	21	Games	31.87
8	Distribution of medicines	133.45	22	Production of medicines	31.19
9	Information technology	128.59	23	Insurance	27.98
10	Real estate	124.02	24	Banks	26.04
11	Retail chains	119.93	25	Clothing and cosmetics	24.21
12	Automotive	113.96	26	Fuels and gas	-5.91
13	Metallurgy	110.28	27	Food products	-17.21
14	Electromechanical industry	79.93	28	Transport and logistics	-55.77
WIG-ESG					11.75

Source: own elaboration.

The cumulative rate of return on the WIG-ESG index during the research period was 11.75%. Taking into account particular sectors, the highest cumulative rates of return were recorded for wholesale trade (355.51%) and medical equipment (309.72%). The lowest cumulative rates of return were recorded in sectors such as transport and logistics (-55.77%) and food products (-17.21%).

The process of shaping particular rates of return over time also seems to be worth noting. Figure 5 shows the development of the two highest and two lowest cumulative rates of return

on the sectors from the index and the values of the cumulative rate of return on the entire WIG-ESG index in the analyzed period.

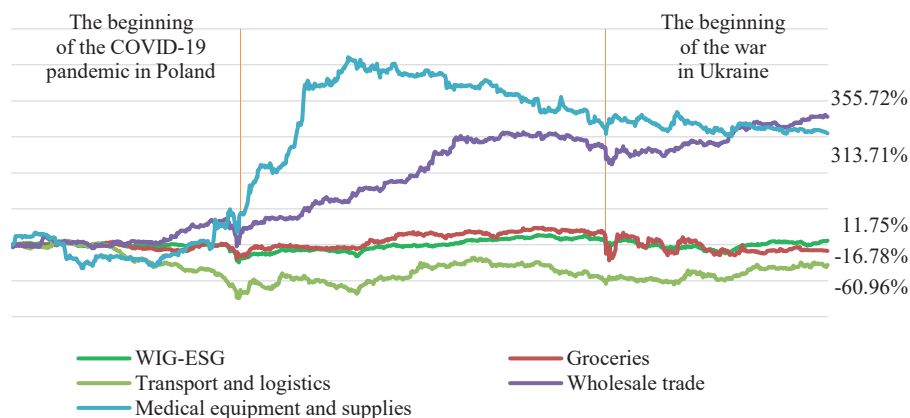


Figure 5. Two highest and two lowest cumulative rates of return on the WIG-ESG sectors against the background of the cumulative rate of return on the whole WIG-ESG index, in the period from January 2019 to April 2023

Source: own elaboration.

By most of the research period the highest values of the cumulative rates of return were recorded for the medical equipment sector, which most likely may be due to the fact that the research period overlaps with the period of the COVID-19 pandemic. In the last few months, however, the cumulative rate of return on companies from the wholesale trade sector turned out to be higher. The lowest values of the cumulative rates of return were recorded for the transport and logistics sector, which most likely may be caused by the disruption of supply chains during the COVID-19 pandemic. The cumulative rate of return on the WIG-ESG index in the whole research period can be assessed as stable.

A comparative analysis was performed by calculating the cumulative rates of return for sector indexes or broad business sectors, this means for sectors corresponding to these identified in the WIG-ESG index. For half of all cases, sector indexes have been identified and their values have been used. For companies not having a dedicated sector index, the average value for the broad business was adopted. The exact number of companies in the sector indexes and broad business indexes can be seen in Table 3.

Table 3. Comparison of the number of companies in sector indexes, broad business sectors and the WIG-ESG index as of April 30, 2023

No.	Sector	Number of companies in the sector	Number of companies in the WIG-ESG	Sector index (at 30.04.2023)
1	Wholesale trade	10	1	does not exist
2	Medical equipment	13	1	does not exist
3	Recycling	12	1	does not exist
4	Biotechnology	20	1	does not exist
5	Capital market	12	2	does not exist
6	Construction	15	2	WIG-BUDOW
7	Receivables	13	1	does not exist
8	Distribution of medicines	13	1	does not exist
9	Information technology	10	4	WIG-INFO
10	Real estate	8	2	WIG-NRCHOM
11	Retail chains	10	3	does not exist
12	Automotive	5	3	WIG-MOTO
13	Metallurgy	8	1	does not exist
14	Electromechanical industry	33	2	does not exist
15	Mining	3	3	WIG-GORNIC
16	Media	6	3	WIG-MEDIA
17	Recreation and leisure	18	2	does not exist
18	Chemical industry	7	1	WIG-CHEMIA
19	Energy	4	5	WIG-ENERG
20	Telecommunication	11	2	does not exist
21	Games	5	3	WIG-GRY
22	Production of medicines	6	1	WIG-LEKI
23	Insurance	7	1	does not exist
24	Banks	10	8	WIG-BANKI
25	Clothing and cosmetics	4	3	WIG-ODZIEZ
26	Fuels and gas	5	1	WIG-PALIWA
27	Food products	7	1	WIG-SPOZYW
28	Transport and logistics	12	1	does not exist

Source: own elaboration.

The results of comparing the cumulative rates of return on WIG-ESG companies – grouped into sectors – with the cumulative rates of return on the sector indexes or the average cumulative rates of return on the broad business sectors are below in Table 4.

Table 4. Comparison of the average cumulative rates of return on WIG-ESG companies – grouped into sectors – with the average cumulative rates of return on the sector indexes or the average cumulative rates of return on the broad business sectors, in the period from January 2019 to April 2023

No.	Sector	Sector index (at 30.04.2023)	Cumulative rate of return on the WIG- ESG (%)	Cumulative rate of return on sector index or broad business sector (%)	Difference between cumulative rate on the WIG-ESG and on sector index or broad business sector (p.p.)	Higher value of cumulative rates of return
1	2	3	4	5	6	7
1	Wholesale trade	does not exist	355.51	193.14	162.37	WIG-ESG
2	Medical equipment	does not exist	309.72	109.72	199.99	WIG-ESG
3	Recycling	does not exist	274.14	269.59	4.54	WIG-ESG
4	Biotechnology	does not exist	196.26	205.63	9.36	Sector index/ broad sector
5	Capital market	does not exist	190.74	155.63	35.12	WIG-ESG
6	Construction	WIG- BUDOW	166.06	106.66	59.41	WIG-ESG
7	Receivables	does not exist	148.18	72.25	75.93	WIG-ESG
8	Distribution of medicines	does not exist	133.45	133.45	0.00	equal values
9	Information technology	WIG-INFO	128.59	92.96	35.63	WIG-ESG
10	Real estate	WIG- NRCHOM	124.02	57.65	66.37	WIG-ESG
11	Retail chains	does not exist	119.93	149.56	29.63	Sector index/ broad sector
12	Automotive	WIG-MOTO	113.96	93.74	20.22	WIG-ESG
13	Metallurgy	does not exist	110.28	105.87	4.40	WIG-ESG
14	Electromechanical industry	does not exist	79.93	113.82	33.89	Sector index/ broad sector
15	Mining	WIG- GORNIC	73.61	60.57	13.03	WIG-ESG
16	Media	WIG-MEDIA	64.23	65.28	1.05	Sector index/ broad sector
17	Recreation and leisure	does not exist	63.50	165.28	101.79	Sector index/ broad sector
18	Chemical industry	WIG- CHEMIA	55.62	37.30	18.32	WIG-ESG
19	Energy	WIG-ENERG	46.40	17.95	28.44	WIG-ESG
20	Telecommunication	does not exist	40.18	177.45	137.27	Sector index/ broad sector
21	Games	WIG-GRY	31.87	33.87	2.00	Sector index/ broad sector
22	Production of medicines	WIG-LEKI	31.19	-5.52	36.71	WIG-ESG
23	Insurance	does not exist	27.98	146.52	118.53	Sector index/ broad sector

1	2	3	4	5	6	7
24	Banks	WIG-BANKI	26.04	15.55	10.49	WIG-ESG
25	Clothing and cosmetics	WIG-ODZIEZ	24.21	49.56	25.35	Sector index/ broad sector
26	Fuels and gas	WIG-PALIWA	-5.91	-4.71	1.20	Sector index/ broad sector
27	Food products	WIG-SPOZYW	-17.21	-9.10	8.11	Sector index/ broad sector
28	Transport and logistics	does not exist	-55.77	199.61	255.38	Sector index/ broad sector

Source: own elaboration.

The red color in Table 4 denotes a higher of two rates of return and green denotes a lower of two rates of return. If the rates of return were equal in both cases, their values were marked in yellow. The highest difference between the cumulative rates of return was recorded for the transport and logistics sector (255.38 p.p.), while there was no difference for the distribution of medicines sector Figure 6 presents the number of sectors for which rates of return turned out to be higher for the WIG-ESG index than for a corresponding sector index or a broad business sector.

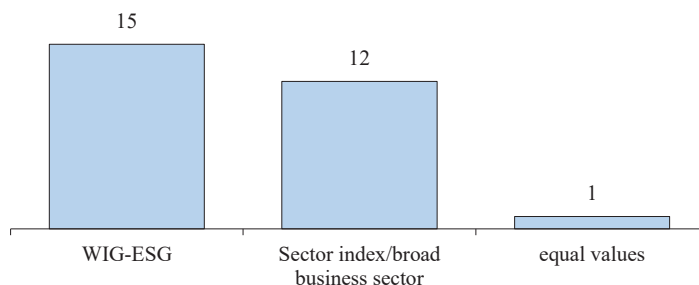


Figure 6. The number of cases for which the cumulative rates of return were higher than other or equal

Source: own elaboration.

For more than half of all the cases, the cumulative rates of return on the WIG-ESG companies grouped into sectors, turned out to be higher than the analogous rates of return calculated for corresponding sector indexes or broad business sectors. Cumulative rates of return on sector indexes or broad business sectors were higher than on the WIG-ESG sectors only in twelve cases. In one case (distribution of medicines), the rates of return turned out to be identical, because only one company – Neuca SA created this business sector.

Conclusions

Based on the obtained results, the research hypothesis stating that investing in companies of the sectors from the WIG-ESG index allowed to achieve higher rates of return than in corresponding sector indexes or broad business sectors in the years 2019–2023, has been confirmed.

The results of the conducted research allowed to draw the following conclusions:

1. Cumulative rates of return on investments in socially responsible companies included in the WIG-ESG index were in most cases higher than analogous rates obtained on investments in companies from sector indexes or broad business sectors.
2. The highest rates of return on the sectors represented in the WIG-ESG index were recorded for the following: wholesale trade (355.51%) and medical equipment (309.72%).
3. The lowest rates of return from the sectors included in the WIG-ESG index were recorded for the following: transport and logistics (-55.77%) and food products (-17.21%).
4. In the period from January 2020 to January 2021, the highest cumulative rates of return were recorded for companies from the WIG-ESG index belonging to the medical equipment sector, which was related to the period of the COVID-19 pandemic.
5. The lowest values of cumulative rates of return for most of the research period were recorded by companies belonging to the transport and logistics sector, which is most likely due to the disruption of supply chains during the COVID-19 pandemic.

Despite the confirmation of the research hypothesis, it is worth noting that the surplus of the rates of return achieved by the companies included in the WIG-ESG index over sector indexes and broad business indexes occurred only in a little over half of the cases (53% of all). The achieved results cannot be for this reason considered as clearly unambiguous and from this perspective they are consistent with the results obtained by Wolska and Czerwonka (2013) and Duliniec (2015). Referring to the surplus of rates of return on socially responsible companies over companies from the broad market, the obtained results confirm the conclusions presented by Lulewicz-Sas (2014) and Jędrzejka (2014). The obtained results should be also considered bearing in mind that the research period covered the COVID-19 pandemic, which was a period of increased volatility in most stock indices.

The limitation of the research is the relatively short period since the WIG-ESG index has been published, even though the study was carried out for a period covering over four

years, from January 2019 to April 2023. An attempt to analyze the rates of return of companies from the WIG-ESG index and companies outside this index, grouped into business sectors, required a comparison of business sectors with unequal numbers of entities. It was due to the construction of the WIG-ESG index, where some business sectors were represented by only one company.

In future studies, it is worth extending the research by using other methods of measuring the effectiveness of investing in socially responsible companies. It might be also interesting to conduct a comparative analysis between the ESG and CSR stock indexes at the international level and observe how the results differ between the markets.

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