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The Impact of ESG Factors on Asset Returns: Empirical Research

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ABSTRACT

The subject of the research is the assessment of Investment decision-making efficiency considering the sustainable development requirements. The article **aims** to identify the relationship between environmental, social and governance (ESG) performance and market returns for investors and the reasons for it. The relevance of the paper is determined by the need to develop research in the field of ESG integration and evaluation of the portfolio investment effectiveness in the context of responsible investment practices popularity. **Scientific novelty**: the study develops the theory of ESG integration and allows the authors to conclude that ESG commitment is a driver of market profitability for investors. The authors apply **methods** such as theoretical analysis of scientific publications (analysis, synthesis, generalisation) and quantitative methods, including statistical data analysis, regression analysis, financial modelling. The research base is scientific works of domestic and foreign authors, analytical reports of rating agencies, ESG funds, historical stock market data on companies analysed in the course of this study. All the information used in this study is publicly available or provided by the Bloomberg database. In the course of the study, authors form model portfolios of ESG-oriented and ESG-neutral companies shares and perform a comparative analysis of their fundamental indicators and financial returns. The authors **conclude** that the portfolio of ESG-oriented companies demonstrates profitability no lower than the portfolio of ESG-neutral companies, considering the risks. At the same time, the values of the fundamental indicators of ESG-oriented companies are inferior to the values of ESG-neutral companies. The relationship between the degree of a company's ESG compliance and its investment attractiveness is due, among other things, to non-financial value drivers. The authors recommend integrating ESG into the analysis of investment portfolios, significant for the development of investment strategies.

Keywords: sustainable development; responsible investment; ESG integration; portfolio analysis; return on investment; value drivers; ESG financial impact

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INTRODUCTION

As the importance of non-financial factors related to sustainable development requirements grows, there is a need for comprehensive and reliable methods of assessing how various factors of environmental, social and corporate governance (ESG) risks and opportunities affect the effectiveness of investment strategies and value creation.

The most significant ESG issues for investors are:

- environmental issues — climate change, carbon emissions, air and water pollution;
- social factors and risks — health and safety, human rights, labor practices, employee engagement;
- issues of corporate governance — the digital transformation of business, executive compensation, board diversity, anti-corruption [1, 2].

In recent decades, a large number of frameworks have appeared presenting possible solutions for the formation, structuring, and disclosure of non-financial information that is important for investment decisions [3].

Significant progress in this matter has been achieved as a result of the active development of non-financial reporting standards, including the GRI (Global Reporting Initiative) sustainability reporting standards and the IR (Integrating Reporting) conceptual framework for integrated reporting, as well as the SASB (Sustainability Accounting Standards Board or SASB Standards), which regulate the disclosure requirements for companies listed on the American Stock Exchange. The focus on the standardization of non-financial information represents significant progress in terms of content and presentation of information that is important to investors and other stakeholders.

The development of industry standards should be viewed as a positive trend, since they allow considering specific industry risks and value drivers that are significant for investors. In addition, a system of thematic disclosures is actively developing, for example, related to climate, epidemiological risks, in particular COVID-19, and their financial implications [4].

We have concluded that the disclosure of non-financial information to key users of financial statements, primarily investors, is becoming a steady trend. However, this raises certain problems that significantly impede progress in meeting the information needs of investors [5, 6]:

- despite the common fundamental foundations, the use of different standards for non-financial reporting leads to incomparability of information disclosed in companies' reports;
- there is no clear and obvious relationship between financial reporting data and non-financial information disclosed to interested users;
- the system of internal and external control over the disclosure of non-financial information is in its infancy, the disclosed non-financial information does not yet provide the necessary level of investor confidence;
- rating agencies, individual institutional investors use their own systems for evaluating non-financial data, which leads to different results and recommendations, which also reduces the confidence of data users [7].

Despite all the difficulties, financial institutions and issuers provide a real impetus to improve the system of financial and non-financial information necessary for making investment decisions [1].

An analysis of the theoretical views and concepts that contributed to the formation and development of ESG investment decisions makes it possible to better understand the spread of initiatives that have taken place since the second half of the twentieth century, and to determine the directions of their further development.

We highlight the most significant concepts for the development of the principles of responsible investment. These traditionally include the concept of sustainable development, the theory of stakeholders, the concept of corporate social responsibility of business. We believe that no less significant and historically earlier is *the concept of externalities*, consistently

developed in the works of Henry Sidgwick (1880), Alfred Marshall (1890), Arthur Cecil Pigou (1920) and emphasizing the importance of non-market interdependencies of economic agents and the need to consider the influence of external factors and effects on their activities. Thus, the concept of externalities underlies the understanding of corporate social and environmental issues, as well as corporate social responsibility.

ESG investment creates asymmetric benefits and provides an "insurance effect", that is, protection against negative consequences, especially during a social or economic crisis.

The concept of sustainable development emerged in the early 1970s. This theory challenged the unlimited potential for increased production and consumption due to limited natural resources and increased environmental damage. The famous by Brutland report (1987), defines the concept of sustainable development as "development that meets the needs of the present, without compromising the ability of future generations to meet their own needs" [8]. This definition draws attention to the possibility of growth of economic agents in conditions of objectively existing restrictions and risks, which creates the basis for an extended approach to their financial analysis.

The definition of sustainable development, proposed by T. Van Holt, T. Whelan [9], considers the following fundamental aspects of the concept: "at minimum do not harm people or the planet and at best create value for stakeholders, and focus on improving sustainability performance in areas in which the company or brand has a material environmental or social impact (such as in their operations, value chain, or customers, etc.)".

The stakeholder theory proved to be crucial in the development of the concept of corporate governance and the importance of stakeholders in the process of creating value. In 1984, Freeman proposed a rethinking of the Friedman doctrine (1970),[1] according to which the company's only social responsibility is to increase profit for its shareholders. He argued that since the company's profits are the result of its activities and interactions with stakeholders (employees, customers, suppliers, government agencies, society, the environment, etc.), its goal is to satisfy the needs of the latter, which will enable it to receive profit [10].

Later, in 1997, J. Elkington substantiated the famous concept of The Triple Bottom Line [11], which went beyond standard measurements of profit and assumed the need to integrate economic, social, and environmental factors. It also has the thesis that organizations should inform stakeholders about their activities. The Global Reporting Initiative (GRI) has adopted this concept as the basis for the development of a corporate reporting system.

Influenced by these trends, the concept of "sustainable finance" has become widespread, which is directly related to considering ESG information when making investment decisions in the financial sector. The paper by D. Schoenmaker, W. Schramade [12] highlights the development stages of the concept of sustainable financing and its practical implementation. According to this concept, in the world and in society over time, there is a gradual shift from the shareholder value to the stakeholder value. As the principles of sustainable financing develop, economic, or rather financial, criteria for investment decisions will recede into the background compared to environmental and social criteria [12].

The development of these concepts has become a study of the relationship between financial performance or corporate financial performance (CFP) and ESG [13–15]. Can we expect more competitive companies and better financial performance from more resilient

[1] URL: https://www.nytimes.com/1970/09/13/archives/a-friedman-doctrine-the-social-responsibility-of-business-is-to.html (accessed on 07.07.2021).

companies? Or is it fair to say that investing in sustainable development reduces free cash flow and therefore negatively affects business value, at least in the short term? These alternative positions on the problem are actively discussed in the academic community [16, 17].

Another theory postulated that the direction of the relationship between ESG and CFP is reversed: strong financial performance allows companies to invest in sustainable strategies and practices [18]. This theory provides a strong argument against the simple correlation between ESG and CFP. Without a thoughtful research, it is impossible to determine the causal direction of the relationship (even if there is one).

Considering the above, the purpose of the research was to test the validity of the claim that ESG compliance is a driver of market returns for investors.

LITERATURE REVIEW

The most heated discussions in the area under study are devoted to the following topics:

- the concept and methods of ESG-integration [19–22];
- the relationship between financial and ESG performance [23–26];
- the degree of investor satisfaction with the ESG information disclosure, including new challenges associated primarily with the COVID-19 pandemic [27–29].

According to a meta-review [26], the following main types of ESG research in the financial sector can be distinguished.

The research that analyze the relationship between ESG scores and financial performance of companies. These studies typically use a group of public companies and environmental/social performance indicators to determine how sustainable development initiatives affect financial results [25, 27, 30].

The studies that investigate the effectiveness of the formation of investment portfolios based on ESG criteria. Most investment research examine the relationship between ESG performance and financial performance of asset portfolio using risk-adjusted returns. Later studies also consider the issues of the effectiveness of investment strategies [26, 30, 31]. The growing interest of the investment community in integrating ESG information into decision-making is reflected in recent research [26, 28]. They concluded that, instead of absolute ESG metrics, the best evidence of future investment benefits is positive dynamics, while the company's ESG scores may be average but improving. The study by NN Investment Partners[2] found that companies with average ESG scores that performed positively contributed the most to Sharpe ratios.

Research on specific topics such as climate change or social risks and their impact on investment decisions, which are increasingly important during the ongoing COVID-19 pandemic [4, 27].

In the academic literature, the question "Is it worth it to be sustainable?" has been a topic of discussion over the past decades. Researchers investigate the dependance of a large number of financial performance indicators on ESG factors [14, 23].

The most common indicators are: return on assets, return on equity. Market indicators that most often act as a dependent variable include the cost of debt and equity capital, Tobin's q and Sharpe ratio [14, 23]. At the same time, some scholars argue that the choice of the ESG metric can predetermine the outcome of assessing the ESG-CFP relationship [5].

Most of the studies analyzed show a positive ESG-CFP relationship [13, 14]. The study [26] shows that the identified financial advantages as a result of meeting the requirements of sustainable development prevail in corporate-type works (60% ± 7.2 pp).

For research on investment portfolios, a less significant result was noted (35% ± 7.8 pp). However, the cumulative evidence of positive, neutral, and mixed conclusions about the impact of ESG performance on financial

[2] NN Investment Partners. 2017. The materiality of ESG factors for emerging markets equity investment decisions: academic evidence. URL: https://www.nnip.com/CH_en/corporate/Press/News-Commentary/view/ (accessed on 07.07.2021).

performance was comparable (93% corporate versus 86% portfolio). This confirms the notion that ESG return on investment is on average no different from traditional investments.

There is evidence that corporate managers see sustainability investment as a driver of corporate financial results, while the return on investment in ESG, averaged over many portfolio management strategies, is indistinguishable from the conventional one. A possible explanation for this is the fact that the criteria for evaluating the performance of company managers and investors are different: managers can expect higher expected cash flows, while investors expect to receive the required market return. However, if the growth of corporate financial performance (CFP) correlates with the ESG resilience, why is investing in the same companies not accompanied by additional returns for investors? Conversely, if the relationship between CPF–ESG companies is insignificant, what drives investors to include these shares in their portfolios?

Most investors want returns on their ESG investments that are in line with normal returns. In other words, they do not expect the returns on ESG strategies to outperform traditional strategies. Therefore, a positive result can be considered in studies in which neutral effectiveness was found [26]. Assuming that corporations can achieve better long-term financial performance through sustainability strategies, this relationship can be expected to be reflected in investor strategies.

ESG integration is not a one-size-fits-all strategy. Analysts typically choose best-in-class companies. However, some researchers have found that it is very effective to select the companies that are increasing their ESG rating the fastest (impulse strategy). Since the impulse effect is stronger for firms with initially low ESG ratings, investors may be able to benefit from their selection. The research [30] suggests that changes in the characteristics of ESG companies can be a useful financial indicator for generating alpha.

A review of the literature identified limitations and challenges with regard to methods for analyzing and evaluating investments in ESG. One of the most common criticisms of investing in sustainable development is that it is difficult for investors to correctly identify and properly weigh the various ESG factors when choosing an investment [31].

P. Hawken [32] raised the question of too broad selection criteria. In a review of ESG-focused mutual funds, P. Hawken found that the investment strategies used by most funds allow virtually any publicly traded company to be registered with an ESG fund. This practice has resulted in little difference between the portfolios of many ESGs and conventional funds. Many ESG-focused funds and portfolios still include stocks of companies with controversial ESG practices in certain areas, such as McDonald's and Coca-Cola. Finally, focusing on best-in-class companies based on specific ESG factors can at the same time lead to the inclusion of companies in the portfolio that do not meet other sustainability requirements.

Almost all large companies, regardless of their ESG orientation, can be included in one or more ESG funds. ESG investment funds and ETFs often invest in companies that can be considered "bad players" in one or more ESG parameters. The criteria used to select factors and specific ESG metrics are too subjective and may reflect narrow, conflicting, including ideological or political positions and demands.

Some researchers criticize the selection criteria and note a significant heterogeneity in the approaches of investors, consultants, and managers to investing in ESG in terms of terminology, strategy, and practice [32]. In [33], based on an analysis of the ratings of the six leading ESG rating agencies, it was concluded that they sometimes use conflicting metrics to measure and evaluate ESG.

Some works present a global analysis of institutional investors, which led to the conclusion that "the biggest obstacle for investors is the lack of quality data on the

performance of companies in terms of ESG factors that are significant for them" [1, 3, 6]. Combined with the fact that many studies have used a sample of data from years back to 2010 when ESG's reporting was just being generated, investors may have judged the resilience of companies with big assumptions.

Another challenge is the focus on short-term returns for investors and financial analysts, which can lead to the exclusion of highly ESG-rated companies that are focused on long-term results.

Researchers disagree on whether investing in ESG is effective. There is a lot of empirical research on this topic in the academic literature. Based on the analysis of individual ESG funds, indices, portfolios, or company stocks, some researchers [5, 21] found that the inclusion of ESG factors in investments, as a rule, gave results at the same level or not worse than from investments not related to sustainable development. For example, R. G. Eccles and M.D. Kastrapeli [21], when comparing companies with high and low resilience ratings, found that high-ranked companies significantly outperform in the stock market over the long term. However, many individual and institutional investors still believe that investing in ESG entails a decrease in investment performance. However, academic literature indicates that when appropriately compared (e.g. ESG strategy, investment time horizon, performance metrics), ESG investments deliver performance at least comparable to non-ESG investments [26].

MATERIALS AND METHODS

The research methodology is based on comparing the individual characteristics of two samples of stocks (hereinafter referred to as "model portfolio"), formed based on the compliance of certain stocks with the ESG policy.

This study was carried out in the form of hypothesis testing based on a literature review.

As part of the study, the following main hypothesis was put forward and tested:

H0: the relationship between the degree of ESG compliance of a company with the investment attractiveness of a company's shares is due to factors that are not exclusively related to the fundamental drivers of value.

Thus, the assumption is being tested, among other things, whether the non-financial value of a company's compliance with ESG practices is significant enough to investors that there is an additional source of equity returns for investors. If the return on stocks of companies focused on ESG is higher or identical to the return on peers (considering the risk), and at the same time, such a return will not be correlated in any way with the fundamental indicators of business activity that determine the amount of cash flows and the required rate of return (business value drivers), this will confirm the main hypothesis.

To test the main hypothesis, additional hypotheses were put forward related to the analysis of the ratio of portfolio returns (group of hypotheses H.1) and hypotheses related to the analysis of the ratio of fundamental indicators of portfolios (group of hypotheses H.2):

H1.1: stocks of ESG-oriented companies perform worse than stocks of ESG-neutral companies;

H1.2: ESG-oriented stocks perform similarly to ESG-neutral stocks;

H1.3: stocks of ESG-oriented companies perform better than stocks of ESG-neutral companies;

H2.1: the values of fundamental indicators of value drivers of ESG-oriented companies are worse than the values of similar indicators of ESG-neutral companies;

H2.2: the values of the fundamental indicators of value drivers of ESG-oriented companies are identical to those of ESG-neutral companies;

H2.3: the values of fundamental indicators of value drivers of ESG-oriented companies are better than values of similar indicators of ESG-neutral companies.

Depending on the confirmation of additional hypotheses, the main hypothesis can be

confirmed or disproved in accordance with a given matrix (*Table 1*).

Thus, the main hypothesis of the study will be confirmed if the return on the ESG portfolio is similar to or higher than the return on the ESG neutral portfolio with worse fundamental indicators of the ESG portfolio compared to the fundamental indicators of a portfolio that is ESG-neutral.

In accordance with the hypotheses put forward, this work takes the form of analytical research and uses quantitative methods such as statistical data analysis, regression analysis, modelling, retrospective analysis of indicators.

The Information base of the research include:

1. Scientific works of domestic and foreign authors, analytical reports of rating agencies, ESG funds — to identify existing ESG investment issues.
2. Historical data of the stock market for the companies under study, with the aim of forming model ESG-oriented and ESG-neutral portfolios and their subsequent assessment.
3. Financial and non-financial reporting of the analyzed companies — to consider the fundamental indicators of model portfolios.

All information required to conduct this study is publicly available or provided by the Bloomberg database.

The research stages are:

1. Formation of hypotheses.
2. Compilation of a model portfolio of ESG-oriented companies and a model portfolio of ESG-neutral companies. At this stage, it is important to track industry and geographic aspects and consider the size of the companies to form a comparable portfolio (ESG-neutral companies).
3. Comparative analysis of the profitability of model portfolios. Testing additional hypotheses H1.1, H.1.2, H.1.3.
4. Comparative analysis of fundamental indicators of model portfolios. Additional hypothesis testing H2.1, H.2.2, H.2.3.
5. Interpretation of the results.

It should be noted that the study revealed a number of limitations that significantly influenced the research methodology and the choice of individual analysis tools:

1. Currently, there is no clear criterion for classifying companies as ESG-oriented. The overwhelming majority of public companies disclose information about ESG activities, which allows various rating agencies to form integral indicators in this area. These indicators, together with the expert judgment of portfolio managers, determine the choice of certain stocks for inclusion in the portfolios of ESG funds (whose investment policy is aimed at forming a portfolio of companies focused on ESG).
2. There are no ESG-neutrals among the large market capitalization. This is confirmed by the inclusion of the vast majority of large-capitalization companies in the portfolios of the most popular ESG funds. The inclusion of such stocks in the portfolio can also be explained by the relatively low volatility of the returns on these stocks, which allows stabilizing the portfolio returns within the framework of the fund's investment policy. It should also be noted that the level of ESG information disclosure is significantly higher among large companies, which, due to rather vague selection criteria, gives reason to consider almost any large company as ESG-oriented.
3. Stocks of small and mid-cap companies are included in a limited number of portfolios of ESG funds, which can be explained by the volatility of their returns and lower liquidity compared to stocks of larger companies.
4. It is technically impossible to control the inclusion of certain stocks in any of the ESG funds, which makes it impossible to unambiguously classify any companies as ESG-neutral.
5. The number of comparable companies for small-cap companies is limited, resulting in a relatively small sample size for compiling model portfolios.

To compile a model portfolio of ESG-oriented companies, a number of companies were selected from the most popular ESG-focused funds, according to Morningstar. Many funds

Table 1

Supplemental research hypothesis system for main hypothesis testing

		Fundamental indicators of ESG-oriented and ESG-neutral portfolio comparison		
		Lower (H.2.1)	**Neutral (H.2.2)**	**Higher (H.2.3)**
Total return of ESG-oriented and ESG-neutral portfolio comparison	Lower (H.1.1)	Not confirmed	Not confirmed	Not confirmed
	Neutral (H.1.2)	Confirmed	Not confirmed	Not confirmed
	Higher (H.1.3)	Confirmed	Confirmed	Not confirmed

Source: authors' calculations.

have been limited to those whose investment strategies are to invest exclusively in small and mid-cap companies. Also, an additional positive screening filter was applied to the respective funds in accordance with the Morningstar analyst rating for funds and sustainability rating. The Hartford Global Impact R 6 HGXVX portfolio as of 06/27/2021 was selected from a variety of funds for the purposes of this study, as it has the highest performance in the ratings above.

For the purposes of this study, considering the presence of various financial instruments in the portfolio and the availability of information about individual companies, 10 stocks of companies with the largest share in the fund's portfolio were selected. The model portfolio of these stocks was formed by creating an equal-weighted index.

To compile a model portfolio of ESG-neutral companies for each company from the model portfolio of ESG-oriented companies, comparable companies were selected based on the following criteria:

- Industry according to the Global Industry Classification Standard (GICS);
- the main region of presence;
- enterprise value.

The model portfolio of ESG-neutral companies was also formed through the creation of an equal-weighted index.

The profitability of the model portfolios was calculated retrospectively for the period from 2011 to 2021, the frequency of observations was quarterly. To determine the profitability, the indicator of total return (TR) was used, to assess the level of risk — the indicator of total risk, calculated for each instrument by the Bloomberg terminal system. To test hypotheses H1.1-H.1.3, a pairwise regression tool was used, in which the profitability of the model portfolio of ESG-neutral companies was used as the independent variable, and the profitability of the model portfolio was used as the dependent variable of ESG-oriented companies. The test was carried out by testing the hypothesis that the regression coefficient is not statistically equal to one. Otherwise, portfolio returns are not statistically different. The MS Excel software environment and the S&P Capital IQ information and analytical system were used as a technical analysis environment.

To compare the fundamental indicators of model portfolios (group of hypotheses H.2), the following indicators were used:

- Price/Book Value (P/BV);
- Price/Earnings (P/E);
- Enterprise Value / EBITDA;
- Enterprise Value / Unlevered Free Cash Flow;
- EBITDA margin;
- Return on assets;
- Return on invested capital;
- Asset turnover;
- Debt/EBITDA.

We used quarterly observations from the 1st quarter of 2013 to the 2nd quarter of 2021 (a total of 34 observations for each indicator for 20 companies). The fundamental value of the portfolio was determined in proportion to the weight of the stocks in the portfolio. Hypotheses H.2.1-H.2.3 were tested using a pairwise regression method similar to hypothesis testing H1.1-H.1.3. The technical environment for the analysis was also the MS Excel software environment.

RESULTS AND DISCUSSION

For the purposes of the study, model portfolios were formed, which included the stocks of the following companies:

ESG-oriented portfolio (10 companies with a fixed stock weight in the portfolio — 10%):

- Agilent Technologies Inc;
- Danaher Corp;
- Schneider Electric SE;
- Signify NV;
- Koninklijke Philips NV;
- Koninklijke DSM NV;
- Nuance Communications Inc;
- Trane Technologies PLC;
- Nomad Foods Ltd;
- Boston Scientific Corp.

ESG-neutral portfolio (10 companies with a fixed stock weight in the portfolio — 10%):

- Iqvia Holdings Inc;
- Abbott Laboratories;
- Legrand SA;
- IMCD NV;
- Siemens Healthineers AG;
- AKZO NOBEL N.V.;
- PTC Inc;
- Experian plc;
- Tate & Lyle plc;
- Edwards Lifesciences corp.

The composition of the formed portfolios and the industry affiliation of the companies in the portfolios are shown in *Fig. 1*.

The Bloomberg database was used for the formation of portfolios modeled as of 06/01/2011 to obtain historical data on the profitability and risks of portfolios.

Analyzing the profitability of portfolios over a 10-year horizon (from 2011 to 2021) (*Fig. 2*), it can be noted that the profitability of an ESG-neutral portfolio is slightly higher than that of an ESG-oriented portfolio.

However, the study also found that the ESG-oriented portfolio performed better than the ESG-neutral portfolio during the COVID-19 pandemic crisis (*Fig. 3*).

This observation confirms the results of the study by M. S. Fernandez, A. Abu-Alkheil, G. M. Khartabiel [34], who found that during the financial crisis (2007–2009) German green mutual funds achieved higher adjusted returns than conventional funds. Similar results tend to hold true for economic downturns.

Thus, ESG investment creates asymmetric benefits and provides an "insurance effect", that is, protection against negative consequences, especially during a social or economic crisis. Under these conditions, firms with low ESG scores will have to offer a risk premium, which can be even more noticeable in volatile capital markets.

To test hypotheses H1.1-H.1.3, it is necessary to separately test the differences in the total returns of the model portfolios using pairwise regression. The results of constructing a regression equation for the return of two portfolios are presented in *Table 2*.

The coefficient on the independent variable is statistically significant. In this case, the *t*-statistic when testing the hypothesis that the coefficient is not equal to 1 is equal to:

$$t = \frac{(1 - 0.879)}{0.049} = 2.46.$$

Fig. 1. **The composition of the formed portfolios (Portfolio — ESG-oriented portfolio, Benchmark — ESG-neutral portfolio)**

Source: author's modelling in the Bloomberg database.

Fig. 2. **Total return of ESG-oriented and ESG-neutral portfolios (2011–2021)**

Source: author's modelling in the Bloomberg database.

Fig. 3. **Profitability of ESG-oriented and ESG-neutral portfolios during the COVID-19 pandemic**

Source: author's modelling in the Bloomberg database.

Table 2

Regression statistics for total return comparison

Regression statistics					
Multiple R	0.947988				
R2	0.898682				
Norm. R2	0.870904				
St. error	8.15071				
Observations	37				
	Coefficients	***St. error***	***t-stat***	***p-value***	
X0	0	N/A	N/A	N/A	
X1	0.878644	0.04917	17.86943	1.76E-19	

Source: authors' calculations.

Table 3

Regression statistics for total risk comparison

Regression statistics					
Multiple R	0.957873				
R2	0.917521				
Norm. R2	0.886271				
St. error	0.781736				
Observations	33				
	Coefficients	***St. error***	***t-stat***	***p-value***	
X0	0	N/A	N/A	N/A	
X1	1.005828	0.053311	18.86731	6.68E-19	

Source: authors' calculations.

The *t*-critical value at d*f* = 36, *p* = 0.01 is 2.719. Given that the observed *t*-statistic is less than the *t*-critical, the hypothesis that the portfolio returns are not equal is rejected.

Thus, it was concluded that the return on the model portfolio of ESG-oriented companies does not differ from the return on the portfolio of ESG-neutral companies.

Considering the risk profile of portfolios (*Fig. 4*) presented in the Bloomberg database, we conclude that the level of risk is approximately the same (the total risk level of

Fig. 4. **Comparative risk profile of ESG-oriented and ESG-neutral portfolios**

Source: author's modelling in the Bloomberg database.

Table 4

Regression statistics for fundamental metrics comparison

	EBITDA Margin, %	ROA, %	ROC, %	Total Asset Turnover	Total Debt/ EBITDA	P/BV	P/LTM EPS	TEV/LTM EBITDA	TEV/LTM Unlevered FCF
Regression coefficient (slope)	0.88	0.63	0.62	0.77	1.03	0.59	0.67	0.76	0.78
Stand. Error	0.02	0.05	0.05	0.02	0.08	0.01	0.06	0.03	0.03
T-statistics (for coefficient =1 hypothesis)	6.10	7.99	7.10	9.24	–0.38	34.44	5.41	7.83	6.49
t-critical (p=0,01)	3.25					2.73			
Hypothesis verification	+	+	+	+	-	+	+	+	+
R2	1.00	0.95	0.94	0.99	0.94	0.99	0.78	0.95	0.94

Source: authors' calculations.

an ESG-oriented portfolio is 18,13 compared to the total risk level for an ESG-neutral portfolio — 18,43). Moreover, country-specific characteristics contribute most to the risk assessment.

To test hypotheses H1.1-H.1.3, it is necessary to separately test the differences in the total risk level of the model portfolios using pairwise regression.

The results of constructing the regression of the risk level between the two portfolios are presented in *Table 3*.

Similar to the rate of return, the risk of both portfolios is significantly correlated, which proves the comparability of the companies in the portfolio. The *t*-statistic when testing the hypothesis that the coefficient is not equal to 1 is equal to:

$$t = \frac{(1 - 1.006)}{0.053} = 0.11.$$

The *t*-critical value at d*f* = 33, *p* = 0.01 is 2.73. Accordingly, it was concluded that the risk level of both portfolios was similar.

Based on the test results, it was concluded that the risk and profitability of both portfolios were identical. Thus, hypothesis H.1.2 is confirmed; hypotheses H.1.1 and H.1.3 are rejected.

According to the "classical school", the return on assets in a portfolio is determined by the values of fundamental indicators. Therefore, it is necessary to conduct a comparative analysis of the values of the fundamental indicators of the companies included in the ESG-oriented and ESG-neutral portfolios to identify the internal drivers of profitability of the portfolios under consideration.

Table 4 shows the results of paired regressions of various fundamental indicators built for two portfolios.

Considering the high R^2 values and statistically significant regression coefficients, we can conclude that the fundamental indicators of the model portfolio of ESG-neutral companies are higher than those of ESG-oriented companies. It should be noted that not all ratios are equal to one (except for the indicator characterizing the level of debt burden), which allows us to conclude that the fundamental indicators for ESG-oriented companies are lower.

Note that not only the profitability indicators but also the price multiples of ESG-neutral companies exceed the values of the ESG-oriented companies. One of the possible explanations for such observations may be the fact that among small and medium-sized companies there are dynamically growing companies that invest more actively in their growth and development than in ESG. As companies mature and maintain their growth rates, they tend to reorient their investments towards ESG.

Thus, hypothesis H2.1 was confirmed, hypotheses H.2.2 and H.2.3 were rejected. In contrast to ESG-neutral peers, the portfolio of ESG-oriented companies showed relatively lower values of fundamental indicators directly related to the formation of value for shareholders. At the same time, the fact that the profitability of both portfolios turned out to be comparable allows us to conclude that the behavioral aspects of decision-making are significant for investors, which determined the research results. However, when interpreting these results, the premises and limitations of this study related to the comparability of company data should be considered.

CONCLUSIONS

The aim of the present study was to verify the validity of the statement that ESG commitment is a driver of market returns for investors.

As part of the study, the hypothesis was put forward and tested: the relationship between the degree of ESG compliance of a company and the investment attractiveness of the stocks of a given company is due to factors that are not exclusively related to the fundamental factors of value. To test the main hypothesis, additional hypotheses were put forward related to the analysis of the ratio of portfolio returns, and hypotheses related to the analysis of the ratio of fundamental portfolio indicators.

In the course of the study, model portfolios of ESG-oriented and ESG-neutral companies were formed; a comparative analysis of the profitability and fundamental indicators of model portfolios was carried out.

The result of the study was the conclusion that the portfolio of ESG-oriented companies shows returns no lower than the portfolio of ESG-neutral companies in terms of risk. At the same time, the values of the fundamental indicators of ESG-oriented companies (the level of business activity, return on equity, price multiples) are inferior to the values of ESG-neutral companies (considering the similar level of debt burden). This confirms the main hypothesis that the relationship between a

company's ESG compliance and the investment attractiveness of stocks is due not only to factors related to fundamental (financial) value drivers.

Based on the results, the authors recommend considering the following factors that are significant for the analysis and assessment of investment decisions:

1. Investors who decide to invest in ESG companies and funds are guided not only by the results of fundamental analysis but also by personal beliefs about the importance of ESG.

2. There is a relationship between ESG factors and non-financial risks that are not considered in the market-based valuation of companies (and, as a result, are not translated into higher price multiples).

3. Currently, different segments of the investment community use different investment strategies in the field of ESG, which is manifested in different methods of selecting investments in ESG.

4. Most investors are willing to receive returns on ESG investing that are consistent with normal returns. In other words, they do not expect the returns on ESG strategies to outperform traditional strategies.

5. ESG investing provides asymmetric benefits during social and economic crises. The results of this study support this thesis.

This study develops the theory of ESG integration and contributes to the conclusion that adherence to ESG factors is a driver of market returns for investors.

The authors see the prospects for further research in the study of the relationship between ESG indicators and the characteristics of the investment attractiveness of assets.

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Volkov M.A. — development of the conceptual framework of the article, formulation and substantiation of the hypotheses of the article, search and systematisation of empirical material in terms of the values of fundamental indicators of companies' activities, hypotheses testing through regression analysis, interpretation of the results.
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