

Article

In Search of Sustainability and Financial Returns: The Case of ESG Energy Funds

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Abstract: The world is facing several challenges, and the problem of sustainable development is one of the most important. It is worth considering that European countries are playing a significant role as pioneers in building a sustainable world, such as those promises made by signing the Paris Agreement and European Taxonomy. To achieve ambitious targets within sustainable development, a huge amount of capital is necessary, while financial and capital market participants are expected to demonstrate a high level of engagement in the domain of sustainability. Facing growing interest and demand, a relatively new product—the ESG (environmental, social, and governance) investment fund—was introduced. Scientific literature is providing some controversial views regarding the overall evaluation of this product. Therefore, additional research providing different angles would contribute to a better understanding. This study examines European ESG funds in the energy sector, from the perspective of news flows and investors. It is worth noting that the authors use the word “European” to refer to members of the European Union (EU). The paper consists of the following parts. In the introduction, the current state of this issue is discussed. The following section offers a literature review and a news flow analysis that contributes to a deeper understanding of these issues. A description of the methodology applied for the data analysis follows this, and the final section presents the research results and conclusions. The authors apply statistical analysis and the Carhart model to determine the differences in the performance of the ESG and conventional funds and use their own tool for text analysis to examine the relevance of the topic of ESG to attract client interest. The authors claim that the performance of the European ESG equity funds do not show a statistically significant difference from the non-ESG equity funds in the majority of the periods examined. The application of the adjusted Carhart model demonstrates that the factor of sustainability has a non-significant and negative effect on the fund performance. Finally, the authors highlight the urgent necessity for the unified usage of keywords and terminology, such as “ESG”, “sustainability”, etc., to ensure comparison and attribution possibilities.

Keywords: ESG; investment funds; energy; sustainable development; performance; Carhart model



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1. Introduction

Global warming and climate change are the most discussed and debated topics in Europe; therefore, it is obvious that the transition to a sustainable economy will require significant capital inflows. European countries involved in the Paris Agreement decided to set their own standards through the European Green Deal (supporting these goals in a unified framework), which requires at least a 55% reduction in net greenhouse gas emissions by 2030 and climate neutrality by 2050 (compared to 1990). It is foreseen that the necessary investments and capital requirements would exceed one trillion euro [1]. The public sector

alone will not be able to provide the necessary financial resources; therefore, financial market participants as capital providers will also play an important role in achieving sustainability targets. It is worth considering that interest in sustainable financial products, as well as interest in academic research, is growing. Bioy and Lamont studied the trends of the global landscape of index-tracking sustainable funds [2]. Mercereau et al. claim that sustainable funds are becoming a highly demanded product and determine which kind of investment products promote sustainability [3]. Similar ideas regarding the popularity of sustainability issues within investment products are discussed in a wide range of research papers. For example, Kuzmina and Lindemane [4] discuss an investment strategy based on corporate social responsibility issues. In a separate paper, the same authors cover ESG investment as basics for the development of investment strategies [5]. Silvola and Landau [6] believe that sustainability is a new investment trend. Other authors, such as the authors of [7–10], pay special attention to sustainability as a new trend and a hot topic within investment fund products.

At this point the authors would like to underline that the ESG (environmental, social, and governance) factors have, in recent decades, gained attention from different investors and investment strategies. As a result, asset managers are considering and incorporating the financial materiality of ESG factors (including environmental factors, such as risk of climate change, greenhouse gas emissions, biodiversity, pollution of water and waste; social factors, such as human rights and safety in the workplace; and governance factors, such as ethics, bribery, and corruption) in the investment management process. The overall goal of this approach is better risk management and making a contribution to global sustainability.

Nevertheless, the topic is of particular interest within the scientific research framework and sustainability is an issue on the political agenda (while the necessity for transformation in financing issues is to be considered and addressed [11]); however, the number of studies covering the performance of energy funds is limited. Considering that transition and transformation of the energy sector is of particular interest and importance for achieving both sustainable development and the ambitious targets set by European Union governing institutions and governments of the member states [12–16], the authors highlight the necessity to contribute to the discussion, paying particular attention to the energy sector.

In February 2022, the situation in Europe changed significantly. All countries were struggling with uncertainty and the growing potential for economic recession (or even crises). Inflation levels were well above the ECB target and the energy crisis was looming. How were European ESG energy funds performing? Were they able to deliver higher financial returns in comparison with traditional investment funds which did not consider ESG impact and risks? These and other questions are often discussed with experts and clients within the asset management industry, but also on professional discussion platforms as well as during scientific conferences and academic forums. The authors share their ideas regarding the topic in the current paper.

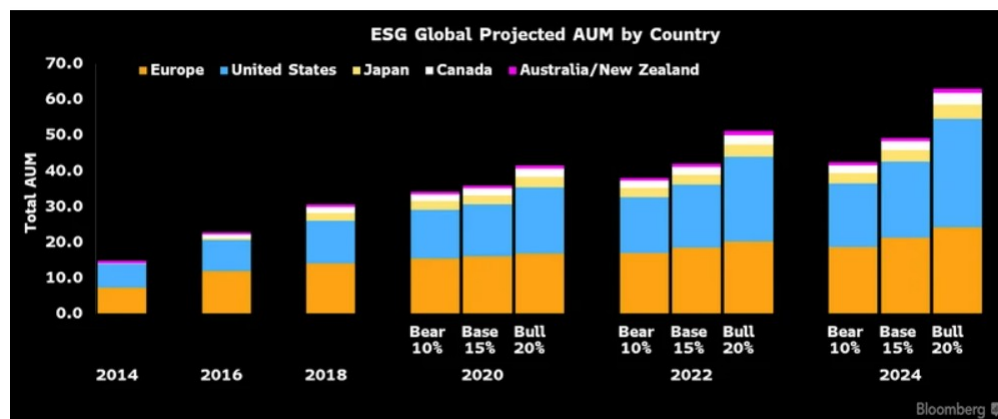
This research examines the risk-adjusted returns of European ESG energy funds to determine investors' potential interest in the product. The period of study is divided into four sub-periods: the pre-COVID-19 pandemic period; the COVID-19 pandemic period; the pre-Russian-Ukrainian war period; and the period after 24 February 2022. The study utilizes statistical analysis and the adjusted Carhart model.

Moreover, this study determines to what extent the analyzed funds cover the issues of ESG and sustainability in their publicly available documents. This information would allow the public to make assumptions regarding the relevance of the topic to attract private and institutional client interest.

The topics of sustainability and ESG investing (with regards to capital management in investment funds) are currently not only on the political agenda but are also widely discussed in the professional environment due to their increasing popularity as investment tools. The major statement is that the ESG investment is an investment category showing non-proportional growth, while the amount of so-called ESG assets is expected to reach approximately USD 53 trillion by the year 2025. The data from the Bloomberg terminal

are shown below (Figure 1). These data demonstrate that ESG investing is no longer a niche product with limited application, but is the basis for the development of the investment industry.

ESG projected global AUM



Source: GSIA, Bloomberg Intelligence

Figure 1. Forecasted amount of ESG assets under management according to the Bloomberg forecast [17].

Moreover, the topic is broadly covered within scientific research. Major topics include discussion regarding ESG strategies within different asset classes and regions, including discussion on the opportunities to integrate ESG data within the decision-making process [18–23]. The considerations on the quality, methodology, and usability of ESG ratings, emphasizing not only the limitations, but also the necessity for deeper understanding and transparency, are crucial to avoid biased decisions [24–30]. The evaluation of the financial performance of ESG products within different asset classes and regions show controversial results, due to differences in data selection procedures, investment horizons, and the research methodology applied [30–35]. Simultaneously, the analysis of the existing literature of the European equity fund performance within this particular sector is limited in comparison with the range of the articles available in other domains.

It is worth considering that European politicians have agreed on ambitious targets regarding sustainable development and the transition to renewable resources and a green economy, and they expect the financial and capital market to contribute to this process as a considerable amount of capital is required. A huge variety of white papers and comments underline the role of the financial and capital market participants in the transition and financing process [36,37].

Similar considerations are found in other research papers. For example, Bointner et al. suggest that sources of renewable energy are of particular importance to sustain Europe's 2030 transition goals in the energy sector while different sources of funding are required. According to the research mentioned above, EU member states are funding renewable energy to a greater extent than the European Commission is, but funding from both sources is expected to increase in the coming years [38]. Fragkiadakis et al. performed an analysis on both public and private investments in low-carbon research and development and stated that private investment allows for lower technology costs, higher productivity, GDP growth, and a higher level of competitiveness [39]. The role of fundamental re-direction in financial capital is the focus in the research by Geddes and Schmidt [40]. The transition to a green and sustainable economy is seen as a challenge providing a number of opportunities within the financial framework [41–46].

On the other hand, new regulatory requirements and changes in political and economical expectations increase interest in the domain. The results are presented in the chart below (Figure 2). Due to the recently introduced functionalities, it is possible to extract the

data for a limited time period starting from 2020; nevertheless, the amount of data allows us to draw some conclusions.

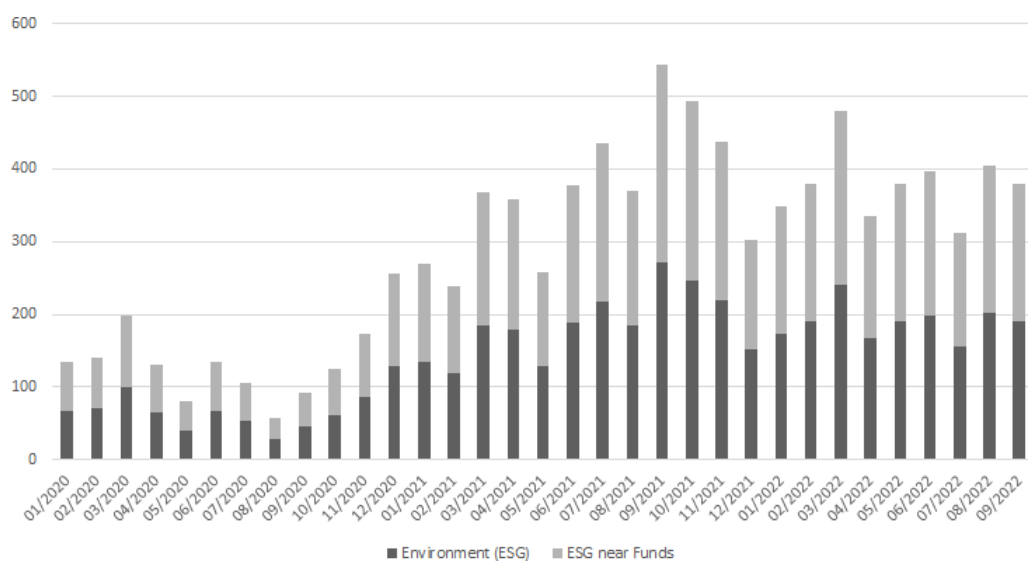


Figure 2. ESG and ESG funds mentioned in the Bloomberg terminal during January 2020–September 2022 (source: created by authors based on Bloomberg data available on 10 October 2022).

The data shows an increasing trend in the number of mentions of “ESG (Environment)” and “ESG near funds” in the news on the Bloomberg terminal. The first keyword represents the issue of sustainability in the energy sector (other ESG aspects are either not considered or considered less relevant). The second keyword represents the cases where the ESG factors are considered in the asset management process of the funds. This data could be interpreted as increasing interest of financial market participants in the topic, while the peaks are seen at the end of 2021 (probably due to the development of the European taxonomy and further news regarding the SFDR requirements) and March 2022 (partially due to the increase in geopolitical risks).

Further analysis allowed us to determine the companies mentioned in the news in connection with the topics mentioned above from January 2020 to September 2022. The figure below demonstrates the number of total documents published in the period (Figure 3). It is worth considering that while the environmental topic is closely related to the energy sector and renewable energy projects, the majority of companies are not from the energy sector.

The data do not allow us to determine the reasons behind it, but do allow us to consider that the news flow influences the interest of financial market participants in various topics, but is less favorable in the energy sector. Therefore, it is an obstacle in the sustainable development process within the sector of energy.

The authors used the Google Books Ngram Viewer, which displays how the selected keywords occurred in a corpus of books over the selected years and trends. The authors selected the period from the beginning of 2000 until the end of 2019 and searched for the following keywords: “energy, return, performance, trend, sustainability, taxonomy, renewable, SDG, green economy, ESG”. The selection of keywords is based on previous experience in the field and discussion among the authors.

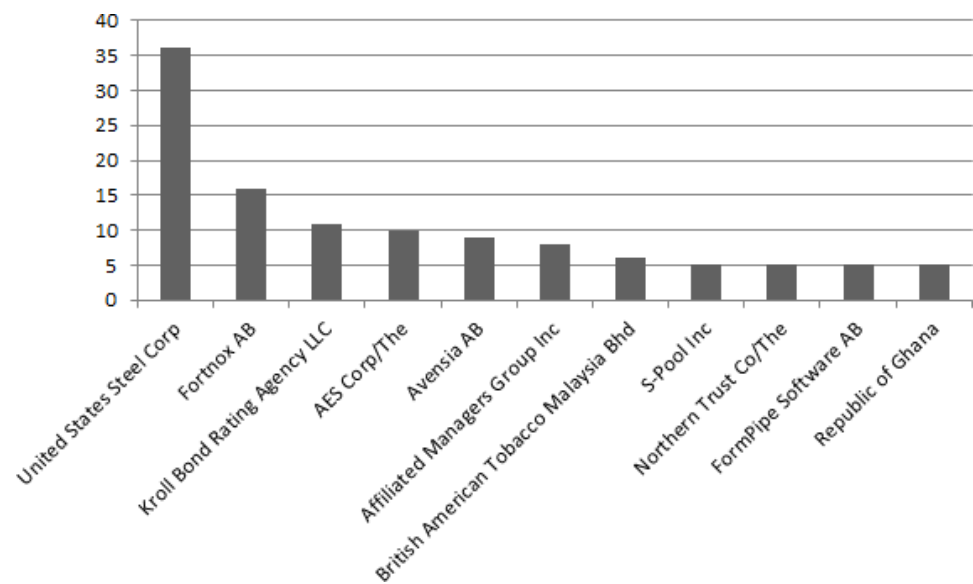


Figure 3. ESG and ESG funds mentioned and company research documents on the Bloomberg terminal from January 2020–September 2022 (source: created by authors based on Bloomberg data available on 10 October 2022).

The results of the study demonstrate that 3 out of 10 keywords play a dominant role in the research. The terms “energy”, “return”, and “performance” were more relevant in comparison with the others and their leading role did not change over the years. As a result, we believe that the selected issue is of particular theoretical importance and has added value for practical implementation. On the other hand, the results show the minor role of other keywords, even though the general expectations were different due to the existing political agenda in Europe (Figure 4). It is obvious that regardless of political pressure and the wish to develop a green economy and sustainability (including SDGs, ESG, etc.) that the prevalence of these topics within research is still low and that they do not support further development.

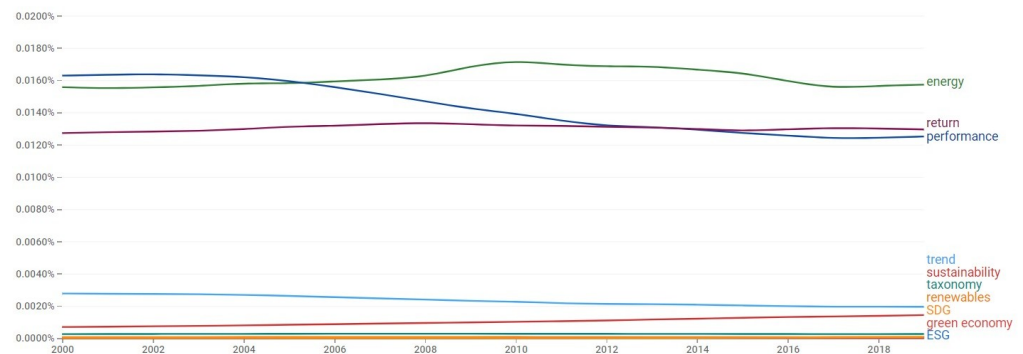


Figure 4. Ten keyword analyses with Google Books Ngram Viewer.

The analysis allowed us to determine the leading keywords that occurred in a corpus of books over the selected years, but also to notice that while the appearance of “return” is stable, “energy” and “performance” lost their attractiveness (measured by the occurrence) over the period of time. Nevertheless, research within the wide field of energy is the most relevant among the selected topics and will likely not lose its attractiveness in the coming years, regardless of political agendas.

To sum up, the authors have studied the topics related to ESG investing and sustainability issues through a literature analysis and news flow. One should consider that the periods chosen for analysis of different information sources are not similar due to

the number of restrictions on the particular data source; nevertheless, it allows to see the challenges in the trends related to ESG investing and sustainability issues.

2. Description of Applied Methodology

A number of studies analyzed the performance of ESG funds by applying the regression model. The authors considered following the research steps and applying the Carhart adjusted model (as suggested by [47–50]) to determine the impact of sustainability (ESG) on fund performance within the energy sector.

The current study differs from others as the authors apply particular selection criteria to the analyzed sample as described below (Table 1). The Bloomberg database (total number of funds equals 1,142,298 as of September 2022) was used to determine the sample of European ESG and non-ESG funds claiming to invest the majority of their assets under management in the energy sector, and their inception data are from a minimum of 5 years ago.

Table 1. Selection criteria for data sample.

Criteria	Number of ESG Funds	Number of Non-ESG Funds
Market Status: Active	433,107	433,107
Fund Asset Class Focus: Equity	48,104	48,104
Fund Industry Focus: Energy	445	445
General Attribute: ESG	23	Not applicable
Total Number after Restrictions	23	35

By applying the selection criteria as described above, 23 ESG funds and 35 non-ESG funds were determined. Ten ESG related funds and ten non-ESG related funds were selected for further analysis. The selection was achieved based on the amount of total assets under management. In both samples, the total amount of assets under management was approximately 89% of the total amount of all funds in the category based on the Bloomberg data and applying selection criteria, so that the authors can claim that the biggest European equity funds within the sector of energy are representative of the overall market situation in the sector. A short description of the dataset used for the analysis is available in the Table 2 below.

Table 2. Short description of the data sample.

Length of the Data Sample	Frequency	Start Date	End Date	Source of Data
1305 data entries for each ESG fund and non-ESG fund	Daily closing prices	1 September 2017	1 September 2022	Bloomberg terminal (data are not public, subscription required). There are no ethical issues about obtaining the data used.

The analysis is based on the application of an adjusted Carhart model, adding a dummy variable “1” in the case of the ESG fund and “0” in the case of the non-ESG fund, which allows us to search for the impact of sustainability on fund performance. The multi-factor Carhart model [51] is known for expanding on the single-factor model (such as CAPM) and considering additional risk factors as the market exposure of a given fund (MKT), the size (SBM), the book-to-market value (HML), and the momentum (WML), resulting in the equation below (Equation (1)). The *alpha* determines the adjusted abnormal return of the fund, *beta* (SMB) measures the effect of so-called small companies in the fund, *r* (SMB) represents the return spread between small and big companies at the time *t*; *beta* (HML) measures the effect of so-called value companies in the fund, while *r* (HML) represents the return spread between value and growth companies at the time *t*; *beta* (WML) measures the momentum effect, while *r* (WML) represents the return spread between winner and loser portfolios over the last 12 months at the time *t*. It should be

noted that further explanation of the factors is less relevant in the current paper as they do not differ from the CAPM model and the Fama and French 5 factor approach, and are explained in detail by Carhart [51].

$$r_{i,t} - r_{f,t} = \alpha + \beta_{MKT} * (r_t - r_{f,t}) + \beta_{SMB} * r_{SMB,t} + \beta_{HML} * r_{HML,t} + \beta_{WML} * r_{WML,t} + \eta_t \quad (1)$$

It is then necessary to add the sustainability impact and expand the previous equation 208 as following (Equation (2)), where *beta* (ESG) measures the effect of sustainability in the 209 fund, while *r* (ESG) represents the return spread between ESG and non-ESG funds at the time *t*.

$$r_{i,t} - r_{f,t} = \alpha + \beta_{MKT} * (r_t - r_{f,t}) + \beta_{SMB} * r_{SMB,t} + \beta_{HML} * r_{HML,t} + \beta_{WML} * r_{WML,t} + \beta_{ESG} * r_{ESG,t} + \eta_t \quad (2)$$

To validate the model, validity tests were performed using a correlation test and a multi-collinearity test. Both tests showed neither correlation problems nor multicollinearity problems, because the values were above 0.5 in the first test and above 1 in the second test. The findings are considered as sufficient to rely on the validity of the results and will not be discussed further.

In addition to the quantitative research, the authors considered using qualitative research based on text information analysis. The approach involves applying the keyword search engine developed by Māris Purviņš which allows for the searching of keywords on a particular internet homepage and delivers accurate and targeted graphical results. The figure below shows the user interface where the researcher should define the project name, websites, and 170 keywords that the system will search for in related databases (Figure 5). The figure demonstrates that the process of the creation and the management of the project consists of 2 steps. The first step requires the creation of the project by specifying the research keywords and web addresses, where the keywords will be searched. In the second step, the user of the engine has the opportunity to manage the project, to correct the keywords and addresses, as well as to delete the project.

The screenshot displays the user interface of a project management tool. At the top, there is a navigation bar with the logo 'You: Māris' and links for 'Projects', 'Result', 'Privacy policy', and 'Terms of service'. A search bar is located on the right side of the navigation bar. The main content area is titled 'Projects' and is divided into two sections. The first section, '1st STEP - Create project and add URLs you want to scan', contains two input fields: 'Project name' (with a placeholder 'Enter project name') and 'Search keyword' (with a placeholder 'Enter one keyword per row'). To the right of these fields is a larger text area for 'URLs list' (with a placeholder 'Enter one URL per row - e.g.: https://example.com'). A blue 'Confirm' button is positioned below the 'URLs list' field. The second section, '2nd STEP - Manage your projects', shows a list of existing projects. The first project is 'Green environment (created: 2022-10-23 12:12:11)' and the second is 'First test project (created: 2022-10-23 12:17:48)'. Each project entry has a downward-pointing chevron icon on the right side, indicating a dropdown menu for management options.

Figure 5. User interface of the developed tool.

- The research and analysis process consists of the following steps: “Search Keyword” involves determining keywords for further analysis (number of keywords is not limited). The authors have agreed on a number of keywords based on the literature analysis and authors’ experience in the field.
- “URLs List” involves determining the address of the internet homepage (used for the search of the determined keywords). The authors have agreed to use the ESG funds homepages.
- “Scanning” involves starting the scanning process. The researcher can use an unlimited amount of scanning within one homepage in different time periods which allows searching for changes made in different time periods.
- “Search Results” involves allowing the researches access to the research results where they can access the keywords found on the web page, which allows for deeper analysis (to be considered in the coming research papers).
- “Graphical Research Results” involves the identification of related keywords and the determination of its popularity. They are then presented in a graphical way suitable for further analysis.

The authors are dealing with publicly available data and there are no ethical issues about obtaining the data used.

3. Research Results and Discussion

The arithmetic average return obtained for each fund (traditional fund and ESG fund) allows us to compare the performance of the funds with each other and provides insight into random actions. According to the obtained results, not considering the level of the risks taken by the investor, it can be concluded that the ESG funds tended to have lower returns in comparison with the traditional non-ESG funds, suggesting that incorporating ESG factors into the portfolio selection and management process probably does not provide better financial results. It is worth considering that in a period of a weaker financial market, ESG funds show less negative financial returns compared with the non-ESG traditional funds. The results are presented in the table below (Table 3). For analysis purposes, the authors selected a period of five years from September 2017 till August 2022. During the whole period, the ESG-related energy funds achieved a return equal to 4%, compared with the 6% return achieved by non-ESG-related energy funds. The table below presents the results as achieved on an annual basis by each group of the equity funds, but it does not include the separate presentation of the four months of the year in 2017 due to limited relevance.

Table 3. ESG energy funds and non-ESG energy funds returns and *t*-test analysis.

Year	Return (%)	Return (%)	Energy	<i>t</i> -Test (<i>p</i> Value)
	ESG Energy Funds	Non-ESG Energy Funds		* significant if $p < 0.05$
2018	−10.4	−16.4		0.1046
2019	20.0	22.5		0.3452
2020	5.9	31.1		0.1988
2021	21.5	24.7		0.3319
YTD	9.5	31.1		0.0006 *

Moreover, by supplementing the analysis with the Student’s *t*-test, which tests whether there is a significant difference between two independent samples, the following results were obtained: during all periods, there was no significant difference in the performance of the ESG and non-ESG traditional funds. The only significant difference was observed from January to August 2022 (YTD).

The obtained results could suggest that the ESG integration methodology of the ESG funds is heavily related to the exclusion procedure (blacklisting the “sinners” in the energy sector as the industry professionals would express it, meaning that the companies considered to be more risky on the ESG side would be excluded from the investment universe), which does not contribute to better stock picking and so does not provide higher

investment returns. The question to be discussed is whether investors are aware of the fact that willingness to support the transition to sustainability and lower exposure to fossil fuels in the energy sector could result in a less favorable financial performance.

It is worth considering that the obtained results do not contradict general findings with regard to sustainability. The European Securities and Markets Authority in April 2022 published an annual report on the costs and performance of ESG and non-ESG investment funds in the year 2020 [52]. It demonstrates that investors holding the ESG funds (in comparison with non-ESG products) enjoy lower commission costs, while the performance in all product classes, such as bonds, equities, and mixed portfolios is lower in comparison with the performance of non-ESG funds.

Similar findings are present in the scientific literature. For example, Raghunandan and Rajgopal [53] studied the performance of ESG mutual funds (the label is not officially provided, funds were identified by Morningstar) in the United States from 2010 to 2018. The authors concluded that the ESG funds showed low financial returns in comparison with non-ESG competitors. Similar findings are shown in the paper by Baily and Gnabo [54].

Other studies suggest that the ESG stocks demonstrating higher ratings (better scoring in terms of ESG) tend to underperform ESG stocks showing less positive results with regards to sustainability issues [55].

By applying the Carhart model, the authors tested the impact of ESG (sustainability) on fund performance. The analysis demonstrates that the ESG strategy (inclusion of ESG criteria in the management of the equity funds within the sector of energy) do not show significant impact (p -value < 0.05) in any of the tested periods.

Regardless of the existing interest of financial market participants in the ESG topic and the increasing pressure from the European regulators and politicians, the obtained results indicate that ESG integration on a different level and in relation to the sustainability issue do not explain the performance of the fund, and therefore it is not incorporated in the value.

The first period chosen for the test was a period of five years starting from September 2017 until the end of August 2022, as the authors believe that it represents both the development of the sustainability topic in Europe and includes volatile periods in the energy market (according to Bloomberg data). The oil price in the mentioned time frame showed a downwards trend, decreasing in value and losing approximately 61.99% (30.6% annualized) from 2017 to March 2020. From the minimums of 2020 it showed again an increase in price (the latest maximum was seen in March 2022) up to 525.51% (167.93% annualized). The market witnessed a slightly different development in the price pattern of natural gas, with a rather stable period from 2017 until 2020 and afterwards a significant increase of 547.49% (137.82% annualized) from the minimum level in June 2020 to the latest maximums in the summer of 2022.

The results of the regression analysis from applying the modified Carhart model (for the period from September 2017 to August 2022) are demonstrated below (Table 4). During the selected period, three factors (risk-adjusted market exposure, size effect, and book-to-market value effect) determined the performance of the equity funds invested in the energy sector, as their statistical significance for the performance was clear. The influence of the sustainability criteria (ESG-attribution) was slightly negative but not statistically significant. The data demonstrate that the explanation power of the model could be improved, and only three (all of the factors developed and explained by Fama and French [56]) out of five criteria (momentum effect and ESG-attribution) are significant to explain the overall results achieved by the European equity funds investing in the energy sector.

Table 4. Regression analysis applying modified Carhart model (data for the period from September 2017 to August 2022).

Regression Statistics						
Multiple R	0.7225					
R Square	0.5220					
Adjusted R Square	0.5211					
Standard Error	0.0087					
Observations	2606					
	Coefficients	Standard Error	<i>t</i> Stat	<i>p</i> -Value	Lower 95%	Upper 95%
Intercept	−0.0039	0.0002	−16.2612	0.0000	−0.0044	−0.0034
ESG Attribution	−0.0002	0.0003	−0.5868	0.5574	−0.0009	0.0005
Risk-adjusted Market Exposure	0.0077	0.0002	47.1512	0.0000	0.0074	0.0080
Size Effect	0.0028	0.0005	6.0961	0.0000	0.0019	0.0037
Book-to-Market Value Effect	0.0042	0.0003	13.7883	0.0000	0.0036	0.0048
Momentum Effect	0.0002	0.0002	0.7958	0.4262	−0.0003	0.0007

The second step involved the examination of the results of the same selected sample before the military conflict starting 24 February 2022 (Table 5) and after the start of the Russian–Ukrainian war (Table 6) that resulted in growing volatility in the financial market in all asset classes (including the commodities and energy sector), revised (down) forecasts for economic growth, increasing inflation, and rising discussions about energy crises in Europe, and the emerging necessity to use alternative sources of energy. To be able to make some comparisons, two sub-periods of equal length were determined: six months before the start of the military conflict and six months after the start of the war. It is worth mentioning that during the first period, the performance of ESG-related funds was approximately 5% compared to approximately 6% by conventional funds (with a slightly lower level of risk taken).

Table 5. Regression analysis applying modified Carhart model (data for the period from September 2021 to February 2022).

Regression Statistics						
Multiple R	0.7635					
R Square	0.5830					
Adjusted R Square	0.5750					
Standard Error	0.0054					
Observations	266					
	Coefficients	Standard Error	<i>t</i> Stat	<i>p</i> -Value	Lower 95%	Upper 95%
Intercept	0.0006	0.0005	1.2746	0.2036	−0.0003	0.0015
ESG Attribution	−0.0001	0.0007	−0.1571	0.8753	−0.0014	0.0012
Risk-adjusted Market Exposure	0.0068	0.0004	17.3450	0.0000	0.0060	0.0076
Size Effect	0.0019	0.0011	1.7493	0.0814	−0.0002	0.0039
Book-to-Market Value Effect	0.0034	0.0005	6.8403	0.0000	0.0024	0.0044
Momentum Effect	0.0003	0.0007	0.4082	0.6834	−0.0011	0.0017

Table 6. Regression analysis applying modified Carhart model (data for the period from February 2022 to August 2022).

Regression Statistics						
Multiple R	0.5970					
R Square	0.3564					
Adjusted R Square	0.3441					
Standard Error	0.0099					
Observations	269					
	Coefficients	Standard Error	t Stat	p-Value	Lower 95%	Upper 95%
Intercept	0.0006	0.0009	0.7476	0.4554	−0.0010	0.0023
ESG Attribution	−0.0010	0.0012	−0.8165	0.4150	−0.0033	0.0014
Risk-adjusted Market Exposure	0.0056	0.0005	11.1982	0.0000	0.0046	0.0065
Size Effect	0.0078	0.0016	4.7486	0.0000	0.0046	0.0111
Book-to-Market Value Effect	0.0013	0.0008	1.5593	0.1201	−0.0003	0.0030
Momentum Effect	0.0016	0.0009	1.8254	0.0691	−0.0001	0.0033

During the first selected sub-period (before escalation of the military conflict) only two factors out of three factors mentioned above determined the performance of the equity funds: risk-adjusted market exposure and book-to-market value effect. During the second selected sub-period (after the start of war on 24 February 2022) only two factors (risk-adjusted market exposure and size effect) determined the performance of the equity funds. In both periods the influence of ESG attribution is slightly negative and insignificant. It is possible to conclude that regardless of the growing uncertainty and realization of transition risks in the sector of energy, the performance of the funds cannot be explained based on the inclusion of the ESG attribution.

A similar approach to that above was applied when testing the effect of ESG attribution during the COVID-19 pandemic. The COVID-19 pandemic changed the lifestyle and priorities of many families and effected the working life and development strategy and politics of all companies. Regardless of the serious situation in the medical sector, the topic of sustainability and ESG was not neglected.

One should consider that the division into sub-periods is intuitive based on the biased perception of the COVID-19-related statistics and government actions in Europe. The first sub-period (before COVID-19 pandemic) ended in February 2020 when the majority of European countries started to report increasing statistics on new infections and deaths caused by COVID-19. The second sub-period, beginning in March 2022 (after the start of the pandemic) is related to the six months after the virus outbreak causing significant harm to society. During the first sub-period, both groups of funds showed slightly negative results: returns equaled approximately −2% for the ESG-related products and approximately −1% for non-ESG-related products. During the second sub-period, returns equaled approximately −1.8% for ESG-related products and approximately 4% for non-ESG-related products. This study continues to examine if this difference could be explained by the ESG attribution.

During the first selected sub-period (before escalation of the COVID-19 pandemic), two factors (risk-adjusted market exposure and book-to-market value effect) significantly determined the performance of the European equity funds (Table 7). During the second selected sub-period (after the COVID-19 pandemic outbreak) the determining factors did not change (Table 8).

Table 7. Regression analysis applying modified Carhart model (data for the period from September 2019 to February 2020).

Regression Statistics						
Multiple R	0.7866					
R Square	0.6188					
Adjusted R Square	0.6113					
Standard Error	0.0050					
Observations	260					
	Coefficients	Standard Error	t Stat	p-Value	Lower 95%	Upper 95%
Intercept	−0.0101	0.0004	−22.9701	0.0000	−0.0109	−0.0092
ESG Attribution	0.0001	0.0006	0.1518	0.8795	−0.0011	0.0013
Risk-adjusted Market Exposure	0.0071	0.0004	16.9627	0.0000	0.0062	0.0079
Size Effect	−0.0006	0.0011	−0.5333	0.5943	−0.0027	0.0016
Book-to-Market Value Effect	0.0059	0.0014	4.2734	0.0000	0.0032	0.0087
Momentum Effect	0.0013	0.0010	1.3634	0.1740	−0.0006	0.0032

Table 8. Regression analysis applying modified Carhart model (data for the period from March 2020 to August 2020).

Regression Statistics						
Multiple R	0.8943					
R Square	0.7998					
Adjusted R Square	0.7959					
Standard Error	0.0116					
Observations	262					
	Coefficients	Standard Error	t Stat	p-Value	Lower 95%	Upper 95%
Intercept	−0.0002	0.0010	−0.2046	0.8381	−0.0023	0.0018
ESG Attribution	−0.0007	0.0014	−0.5183	0.6047	−0.0036	0.0021
Risk-adjusted Market Exposure	0.0090	0.0005	19.8769	0.0000	0.0081	0.0099
Size Effect	0.0027	0.0012	2.2950	0.0225	0.0004	0.0050
Book-to-Market Value Effect	0.0087	0.0015	5.8680	0.0000	0.0058	0.0116
Momentum Effect	0.0021	0.0009	2.2099	0.0280	0.0002	0.0040

The impact of ESG attribution on fund performance was not significant during any of the sub-periods. It is also worth considering that the momentum effect was not visible during any of the examined sub-periods.

The findings comply with other researchers claiming that the ESG score of a company in the energy sector has a non-significant and negative impact on the financial performance of the company and/or its market value [57–59]. Therefore, one can state that a similar tendency can be noted by examining the performance of the ESG equity funds, where the reinforcement to contribute to the transition to green and renewable energy sources is ideal but is less financially justified. A similar idea was expressed by Liu and Hamori [60]. As a result, there is no evidence that ESG-related investments in the energy sector could contribute to increasing wealth and prosperity in the short term.

Having applied the developed tool (described above), the authors arrived at the following conclusions. It is worth mentioning that the authors agreed on the following keywords to be analyzed: “trend”, “taxonomy”, “sustainability”, “SDGs”, “return”, “renewable”, “performance”, “green economy”, “ESG”, and “energy” and it was determined that “ESG” was a top word among others, while “sustainability” and “green economy” were present least often. One can conclude that even though sustainability is used as an umbrella term for “ESG”, the usage of both keywords is different. The difference in application can be attributed both to regional (cultural) specifics and the existence of very broad definitions of the terms.

All other words are used with the same frequency with exception of “renewable”, which had a usage frequency above the average. This can be explained with the selection of the economic sector for research.

The most important conclusion is the fact that some of the investment funds do not mention “ESG” at all, while others, even though they are managing sustainable funds in the domain of energy, do use terms such as “energy” and “renewable” in a limited way.

The findings make one consider that the absence of general guidelines regarding the description of the financial product (ESG funds in the energy sector) lead to differences in the management strategies applied and the achieved results. Thus, even though all the selected funds were considered as appropriate for the performance analysis, the authors could not identify a link between sustainability and the financial performance of funds. The authors intend to continue the application of research engines in future studies and expect to arrive at a deeper understanding of the problem.

4. Conclusions

Sustainable development is one of the most important challenges faced by European countries, as expressed in promises made within the Paris Agreement and European Taxonomy. The ambitious targets set by politicians can be achieved through a close collaboration between financial and capital market participants. The current research examined the situation in the European ESG funds industry (limited to the energy sector) and the authors were able to conclude that the data demonstrates the increasing interest of financial market participants in the topic of sustainability. The conclusion is based on the fact that several ESG assets under management are constantly increasing according to industry experts, which demonstrates the willingness of the industry to respond to client demand and to fulfill regulatory requirements and society’s expectations. Moreover, the authors observed a growing amount of different literature and news sources covering the topic of ESG-related investing and sustainability as a modern instrument for building investment strategies. Finally, the analysis of the relevant literature demonstrated that the chosen topic is relevant within the scientific discussion and additional research would contribute to the better understanding of the problem, providing evidence for further research, political decisions, and practical implications. It is worth noting that the scientific literature provided, to some extent, controversial results regarding the performance of the ESG-related investment funds that makes the research on the field relevant.

The authors were also able to determine that the performance of the European ESG equity funds do not show significant differences (applying Student’s *t*-test) from the non-ESG equity funds in the majority of the periods, while European ESG equity funds demonstrated lower financial results. These results could be explained by the evidence coming from the asset managers that the integration of the ESG criteria into decision-making process is mainly based on exclusion and probably does not contribute to a better stock-picking solution in the short term (especially during periods of high volatility in financial markets), and so they do not provide higher investment returns. Similar results were found by other researchers and are mentioned in the paper. These conclusions should be considered by politicians, regulators, and investment managers, as they show that support for the transition to sustainability and lower exposure to fossil fuels could result in a less favorable financial performance for clients.

Moreover, by applying the adjusted Carhart model, the authors conclude that the factor of sustainability (through the self-applied ESG label of the equity fund making investments mainly in the energy sector) has a non-significant and slightly negative effect on the fund performance. The authors have tested the hypothesis during some of the sub-periods characterized by the existence of challenges from the external environment, such as the COVID-19 pandemic and the Russian–Ukrainian military conflict. Similar results were obtained by others studying ESG attribution in different regions and investment universes. One can conclude that equity funds within the European energy sector do not demonstrate different behavior. This means that the reinforcements used to contribute to the transition

to the use of more green (including renewable) energy sources is a positive development but is less financially justified for investors.

Finally, the authors stress the urgent necessity for the unified usage of keywords and terminology, such as “ESG” and “sustainability”, etc., to ensure comparison and attribution possibilities. This conclusion is based on evidence which shows that even though the funds are considered as being ESG-related, the amount of information provided for clients and the public is not the same and the level of transparency could be increased.

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