



REVISTA AMBIENTE CONTÁBIL

Universidade Federal do Rio Grande do Norte

ISSN 2176-9036

Vol. 18, n. 2, Jul./Dez., 2026

Sites: <https://periodicos.uffn.br/index.php/ambiente>

[http://www.atena.org.br/revista/ojs-2.2.3-](http://www.atena.org.br/revista/ojs-2.2.3-06/index.php/Ambiente)

[06/index.php/Ambiente](http://www.atena.org.br/revista/ojs-2.2.3-06/index.php/Ambiente)

Article received in: September 24th, 2025. Reviewed by pairs in: February 9th, 2026. Reformulated in: April 1st, 2026. Evaluated by the system double blind review.

DOI: 10.21680/2176-9036.2026v18n2ID44442

ESG Funds versus traditional funds: a performance analysis in the brazilian market (from 2021 to 2024)

Fondos de Inversión ASG versus fondos tradicionales: un análisis de desempeño en el mercado brasileño (2021–2024)

Fundos ASG versus fundos tradicionais: uma análise de performance no mercado brasileiro (2021–2024)

Authors

Júlia Gomes Ramos Abreu

Bachelor's degree in Accounting from the Fluminense Federal University. Address: Mário Santos Braga Street, Downtown, Niterói – RJ, Brazil, ZIP Code 24020-140. Identifiers (ID):
ORCID: <https://orcid.org/0009-0009-2692-968X>
Lattes: <http://lattes.cnpq.br/3036259868036232>
E-mail: abreujulia@id.uff.br

Cíntia de Melo de Albuquerque Ribeiro

PhD in Sustainable Management Systems from Latec-UFF. Adjunct Professor at the Department of Accounting at the Fluminense Federal University. Address: Mário Santos Braga Street, Downtown, Niterói – RJ, Brazil, ZIP Code 24020-140. Identifiers (ID):
ORCID: <https://orcid.org/0000-0002-1957-056X>
Lattes: <http://lattes.cnpq.br/3780699032150649>
E-mail: cintiaalbuquerque@id.uff.br

Aline Moura da Costa Silva

PhD in Accounting from the University of Brasília. Associate Professor at the Department of Accounting at the Fluminense Federal University. Address: Mário Santos Braga Street, Downtown, Niterói – RJ, Brazil, ZIP Code 24020-140. Identifiers (ID):
ORCID: <https://orcid.org/0000-0001-9437-3120>
Lattes: <http://lattes.cnpq.br/6950832161301003>
E-mail: alinemoura@id.uff.br

José Paulo Cosenza¹

PhD in Accounting and Finance from the University of Zaragoza, Spain. Full Professor at the Department of Accounting at the Fluminense Federal University. Address: Mário Santos Braga Street, Center, Niterói – RJ, Brazil, ZIP Code 24020-140. Identifiers (ID):

ORCID: <https://orcid.org/0000-0002-1753-0134>

Lattes: <http://lattes.cnpq.br/4867409136127288>

E-mail: jpcosenza@id.uff.br

Abstract

Purpose: To examines the performance differences between Environmental, Social and Governance (ESG) and traditional funds in the Brazilian market, using risk-adjusted return measures.

Methodology: A quantitative approach was used, with secondary data from the Brazilian Securities Commission on the returns of 3,538 investment funds from 2006 to 2026. The Sharpe Ratio and t-test were applied to address this objective.

Results: In the graphical analysis, ESG funds showed better performance and higher volatility than non-ESG funds. However, the Student's t-test showed that these differences are not statistically significant. Thus, there is insufficient evidence to say that the two portfolios perform differently in a statistically meaningful way.

Contributions: This study contributes to the academic and practical debate on sustainable investments, providing insights for investors, fund managers, and policymakers seeking to balance financial returns with socio-environmental responsibility.

Keywords: ESG; investment funds; sustainability; profitability; performance.

Resumen

Objetivo: Verificar la diferencia de desempeño entre fondos de inversión sostenible ASG y fondos tradicionales en el mercado brasileño, considerando el retorno ajustado al riesgo.

Metodología: Se adoptó un enfoque cuantitativo, utilizando datos secundarios de la Comisión de Valores Mobiliarios (CVM) sobre la rentabilidad de 3.538 fondos de inversión para el período de 2006 a 2026. Para lograr el objetivo propuesto, se aplicaron el Índice de Sharpe y la prueba t.

Resultados: En el análisis gráfico, los fondos que integran criterios ambientales, sociales y de gobernanza (ASG) en las estrategias de inversión presentaron un desempeño superior, aunque con mayor volatilidad, en comparación con los fondos no ASG (tradicionales). No obstante, al aplicar la prueba t de Student para verificar la significancia estadística de las diferencias observadas entre los dos grupos, se constató que dichas discrepancias no son estadísticamente significativas. En otras palabras, no hay evidencia suficiente para afirmar que los desempeños presentados por las dos carteras de inversión difieren de manera estadísticamente significativa.

Contribuciones: Este estudio aporta al debate académico y práctico respecto a las inversiones sostenibles, ofreciendo contribuciones para inversores, gestores de fondos y formuladores de

¹ The authors would like to thank João Gonçalves de Souza for agreeing to do the final review of the English grammar, which contributed to improving the manuscript's quality.

políticas que buscan equilibrar el retorno financiero con la responsabilidad socioambiental.

Palabras clave: ASG; fondos de inversión; sostenibilidad; rentabilidad; desempeño.

Resumo

Objetivo: Verificar a diferença de desempenho entre fundos ASG e fundos tradicionais no mercado brasileiro, considerando medidas de retorno ajustadas ao risco.

Metodologia: Foi adotada uma abordagem quantitativa, com base em dados secundários da Comissão de Valores Mobiliários (CVM) referentes à rentabilidade de 3.538 fundos de investimento no período de 2006 a 2026. Para alcançar o objetivo proposto, aplicaram-se o Índice de Sharpe e o Teste-t.

Resultados: Na análise gráfica, os resultados indicam que os fundos ASG apresentaram desempenho superior, acompanhado de maior volatilidade, em comparação com os fundos não ASG (tradicionais). Contudo, ao se aplicar o Teste-t de Student para verificar a significância estatística das diferenças observadas entre os dois grupos, constatou-se que tais discrepâncias não são estatisticamente significativas. Em outras palavras, não há evidências suficientes para afirmar que os desempenhos das duas carteiras diferem de forma relevante do ponto de vista estatístico

Contribuições: Este estudo contribui para o debate acadêmico e prático sobre investimentos sustentáveis, fornecendo subsídios para investidores, gestores de fundos e formuladores de políticas que buscam equilibrar o retorno financeiro e a responsabilidade socioambiental.

Palavras-chave: ASG; fundos de investimento; sustentabilidade; rentabilidade; performance.

1 Introduction

With the growing need to align the financial market with sustainable practices, the concept of Environmental, Social and Governance (ESG) has been gaining strength on an international level (Li *et al.*, 2021; Friede *et al.*, 2015). The term appeared in a 2004 publication by the World Bank with the UN Global Compact, entitled Who Cares Wins. Soon after the initial release of this concept, the Principles for Responsible Investment – PRI emerged in 2006, developed by investors to establish principles that contribute to broad market awareness, as well as enable stricter regulation of the practices established by the concept (PRI, 2025).

Investors around the world are increasingly interested in environmental, social and governance (ESG) issues (Grim & Plagge, 2022). So, there has been a growing global interest in sustainable investments in the international market over the years (Gibson *et al.*, 2022; Giese *et al.*, 2021). The Global Sustainable Investment Review (2020), published by Global Sustainable Investment Alliance (GSIA), pointed out that the sustainable and responsible investment market has changed the investors' expectations in decision-making regarding the sustainable and responsible investment, having as the principal drivers of the growth between 2016 e 2020 Canada, United States, and the Australasian region (GSIA, 2020).

In Brazil, the percentage of assets evaluated by their respective managers in relation to ESG integration approach and corporate engagement has increased considerably. In 2018, 27% of managers have reported that they considered ESG criteria in more than 50% of the assets under their management. This percentage increase over in the period 2021 form 49%

(Anbima, 2022). Voltolini (2021) emphasizes that this movement represents the beginning of an upward trend, in which sustainability starts to play a central role in business management. Thus, it becomes essential for the Brazilian investment fund industry to adopt ESG practices and principles, since investors have increasingly been using these criteria in the decision-making process.

Several studies point out that ESG funds can offer greater resilience in crisis scenarios and protection against unexpected risks. Pisani and Russo (2021), for example, demonstrated that during the COVID-19 pandemic, funds with higher ESG ratings showed lower risk contagion and higher returns, acting as insurance in times of instability. Similarly, Dmuchowski *et al.* (2023) reinforce that ESG practices tend to correlate positively with long-term performance, especially regarding value preservation during crises. Tang *et al.* (2025), analyzed the Chinese market and found that ESG funds generated higher average returns than traditional ones, with performance 1.2% higher in the assessed period.

On the other hand, several studies reveal limitations and weaknesses. Kuzmina *et al.* (2023), investigated ESG funds in the European energy sector and they did not find statistically significant differences compared to conventional funds, although, in some periods, the ESG ones showed inferior performance. Plagge and Grim (2020) also highlighted the substantial cross-sectional dispersion in the performance of ESG equity funds. These authors found a lack of significant alphas in the performance of most of the funds evaluated and suggested that the simple ESG categories incorporation does not guarantee superior returns, given that none of them produce statistically significant positive or negative gross alpha.

In the Brazilian context, Silva, Oliveira and Pessina (2025) identified 437 funds, mostly equity funds, with assets exceeding R\$ 35 billion, but few outperform benchmarks such as the Brazilian Interbank Deposit Rate (CDI) or the São Paulo Stock Index (Ibovespa), indicating that performance is still limited. However, Guimarães and Malaquias (2023) analyzed 3,840 equity funds between 2006 and 2020, and showed that ESG funds may exhibit greater resilience during crises and periods of financial constraints, such as the COVID-19 pandemic.

Despite the growing interest in environmental, social and governance (ESG) issues around the world, ESG investing still depends on a variety of matters and factors (Grim & Plagge, 2022). The academic literature presents still inconclusive results on the impacts of ESG components on the risk and return of equity securities, reflecting divergent theories and contradictory empirical evidence (Plagge & Grim, 2020; Dmuchowski *et al.*, 2023), including in ESG funds. The combination of inconsistent results and the lack of comprehensive analyses highlight that, despite the academic and practical interest is rising, there are still relevant gaps regarding the performance of ESG equity funds, which justifies the need for further research (Kuzmina *et al.*, 2023; Tang *et al.*, 2025).

Having this in mind, and with the purpose of amplifying the discussion about ESG Investing within the Brazilian context, this study seeks to answer the following question: **What is the difference between the performance of ESG funds and traditional funds (non-ESG) in Brazil?** To help determine this research issue, this study aims to examine the performance differences between ESG and traditional funds in the Brazilian market, using risk-adjusted return measures. To this end, a descriptive analysis of the Sharpe Index and the test of difference of means of risk-adjusted performance between ESG and non-ESG funds was conducted for the period from April 2006 to March 2026.

The growing relevance and urgency of the sustainability agenda in the asset management industry have proven to be key factors for the longevity and resilience of businesses (Anbima, 2022).

ESG integration function as mechanisms for preventing corporate risks, contributing to more conscious and responsible investment decisions (Li *et al.*, 2021). However, there is still

an insufficient number of studies that specifically investigate ESG investment funds in Brazil (Silva, Oliveira & Pessina, 2024), justifying the undertaking of this research.

Furthermore, in contrast to other studies made in developing countries, such as Tang *et al.* (2025) in China, which indicate that ESG integration can generate superior returns, these results point to a distinct dynamic in Brazil. Although ESG funds show higher average returns, they exhibit great volatility and variability in performance, with no statistically significant difference in risk-adjusted performance between ESG funds and traditional funds.

These findings reinforce the heterogeneity of the results observed in the literature and contribute to the advancement of understanding regarding the limits and constraints of integrating ESG criteria into investment strategies, especially regarding risk-adjusted performance. By highlighting the absence of a statistically significant difference between ESG and traditional funds, this study emphasizes that the incorporation of ESG issues does not necessarily imply an in risk-return efficiency improvement, and its effects may depend on contextual factors, such as market maturity and the quality of sustainable investment strategies implemented.

In this context, the results suggest that ESG investment analysis should consider not only the average performance but also the consistency of the results. Additionally, the findings indicate that the adoption of ESG funds does not necessarily imply gains in risk-return efficiency, reinforcing the need for decisions based on multiple criteria, including risk, consistency, and non-financial objectives. Even where an investor is clear on the ESG issue(s) they would like to address there may be several ways to express this preference (Grim & Plagge, 2022).

ESG funds perform differently from the broad market (Plagge & Grim, 2020) and the results suggest that managers need to improve the consistency of their strategies and risk management. For regulators, the importance of greater transparency and standardization is evident, aiming to reduce heterogeneity and strengthen confidence in the segment.

2 Theoretical Framework

2.1 ESG and the Principles for Responsible Investment

Since the Third Industrial Revolution, technological progress has been often disregarded environmental impacts. This has been in contrast to the ideals of the Green Revolution, which aimed to increase agricultural production. However, this pursuit of greater productivity has brought negative impacts on the environment such as soil degradation and agrotoxic contamination (Campagnolla & Macêdo, 2022).

In the 1970s, with the increasing awareness of the negative impacts of accelerated industrialization, the United Nations Conference on the Human Environment was held in Stockholm, Sweden, in June 1972. This conference represented a fundamental milestone in consolidating the understanding that environmental issues should be incorporated into international political agendas.

Initially, these concerns were restricted to the diplomatic and institutional scope, not being considered in the business context (United Nations, 1972). Notwithstanding, guiding principles for global environmental management in the Stockholm Declaration were included, highlighting the importance of cooperation among nations for the protection of natural resources and the promotion of a sustainable development model, which represented a milestone for the gradual beginning of incorporating sustainability issues into governmental and corporate agendas.

Sustainability, by definition, encompasses a wide range of concepts that address human demands, as well as factors related to environmental preservation and economic aspects. As established by the Brundtland Report (United Nations, 1987), sustainable development is that which ensure the human needs of the present without compromising the ability of future

generations to meet their own needs, since the concepts of “environmental resources” and “sustainable development” are inseparable.

In this context, in 1994, the term Triple Bottom Line (TBL) emerged, formed from the idea that business performance should not be evaluated solely by company profit, but should also include social and environmental factors in its corporate metrics and strategies (Elkington, 2004). This perspective highlighted the needs to maintain the interdependence between three basic pillars for sustainable development – profit, planet, and people –, and brought indications of showing signs of change in understanding how to evaluate companies' performance, suggesting that social and environmental aspects should be considered as relevant as financial ones in analyses and strategic decision-making of companies.

Despite the relevance of the topic presented by TBL, the term ESG only emerged in 2004, with the collaboration of the World Bank and the United Nations, who published the report *Who Cares Wins*. This report originated through instigation of the then UN Secretary-General, Kofi Annan in an address to the World Economic Forum in Davos, Switzerland, to highly influential business actors in the financial market about how this market should be integrated with social, environmental, and governance factors (Pacto Global, 2025).

The environmental principle, represented by the acronym ("E"), advocates for the development of companies in a conscious way so as not to permanently harm the environment. Furthermore, it can also be seen, according to a study by Whelan *et al.* (2020), that sustainable initiatives in corporations help improve financial performance, since they encourage risk management as well as innovation. Among the initiatives related to the environment, the use of sustainable and affordable energy sources, the promotion of the sustainability and conservation of natural resources and biodiversity can be highlighted (United Nations, 2025).

The second pillar of the TBL is represented by the acronym ("S"), that refers to the term "social" which encompasses the objectives and policies of a corporation, as well as its relationship with the society where it is inserted. In this context, issues focus on human rights, health and safety, diversity policies, social inclusion, and labor legislation are gaining increasing importance (Borsatto, Baggio & Brum, 2023), as well as the implementing stronger policy actions that promote these matters to achieving the 2030 Agenda (United Nations, 2025). According to United Nations (1987; 2025), the social pillar also seeks to promote inclusive global economic growth through the promotion of development-oriented policies that foster the decent work and economic growth for the entire population.

"Governance", represented by the letter "G," seeks the adoption of practices aimed at promoting good corporate governance, based on the principles of integrity, transparency, accountability, fairness, and sustainability. According to the Brazilian Institute of Corporate Governance (2023, p. 12), through the adoption of the code's recommendations, "organizations demonstrate their commitment to aligning interests; preventing, mitigating, and addressing conflicts; and generating tangible and intangible value for all stakeholders, considering the impacts on the economy, society, and the environment".

In 2006, the Principles for Responsible Investment (PRI) were created by an international group of institutional investors due to the call of the United Nations Secretary-General to highlight the importance of environmental, social, and governance issues in the investment market. The PRI seeks to help investors on how these topics can influence investments and decision-making methodology for entrepreneurs and investors towards investment decision-making. According to the UN Secretary-General, Ban Ki-moon, in recent times, such principles have gained notoriety and, with the support of the UN, help to correct the perception that ESG issues could be ignored in the financial market (PRI Association, 2019).

The principles for responsible investment are voluntary and inspiring and they guide and challenging investors towards decisions that will build a resilient, sustainable global economy.

According to the PRI (2025), the investors of financial market will look at six principles in their decision-making:

1. “**Incorporate ESG issues** into investment analysis and decision-making processes.”
2. “**Be proactive owners** and incorporate ESG issues into our ownership policies and practices.”
3. “**Seek appropriate disclosure** on ESG issues by the entities in which we invest.”
4. “**Promote acceptance and implementation** of the Principles within the investment industry.”
5. “**Work together** to enhance our effectiveness in implementing the Principles.”
6. “**Report on our activities and progress** towards implementing the Principles.”

Considering that the implementation of the six principles is voluntary and can be carried out through a series of actions (PRI Association, 2019), it is feasible for financial market professionals to incorporate and develop this concept, consequently creating a network that extends throughout the world, including Brazil, by promoting a more sustainable global financial system. This membership has been growing steadily, having increased tenfold in 2020, when compared to 2006 (PRI Association, 2019).

Environmental, social, and governance investment has established itself as a model in modern finance, by integrating non-financial criteria into investment decisions and by expanding the analysis beyond economic returns, including long-term social and environmental impacts (Tang *et al.*, 2025). These factors began to receive greater attention from investors and managers, who incorporate their financial materiality — from climate risks, emissions, and biodiversity to human rights, occupational health and safety, and corporate ethics — with the intention of improving risk management and contributing to global sustainability (Kuzmina *et al.*, 2023).

Studies show that companies that adopt structured principles aligned with the ESG agenda tend to have a stronger reputation and more stable financial performance over time, as such practices contribute to mitigate risks related to social scandals, governance failures or environmental disasters (Friede, Busch & Bassen, 2015).

The relevance of the PRI is also manifested in its capacity for collective mobilization, as research indicates that its signatories reinforce their commitment to ESG criteria, achieving, on average, a 6% increase in scores after joining, with an emphasis on the social and governance dimensions. This joint membership increases the investors' power of influence over companies, encouraging more significant changes in corporate practices (Gibson *et al.*, 2020). The ESG principles and responsible investment also directly engage with the Sustainable Development Goals (SDGs), which bring together 17 central challenges for society's quality of life and the preservation of the planet.

2.2 ESG in Brazil

In Brazil, the ESG agenda has been gaining increasing relevance in the strategy formulation process and corporate decision-making, following, albeit gradually, the trend observed in the international market. The adaptation of companies to this scenario arises not only from global competitive pressure, but also from the need to respond to market changes and social demands, which has driven the incorporation of ESG factors into management practices (Pereira, Silva & Carbonari, 2017).

However, compared to European countries and the United States, the implementation of ESG practices in Brazil occurred later. A relevant milestone in this process was the creation, in 2005, of the Corporate Sustainability Index (ISE B3), aimed at evaluating the performance of companies committed to sustainability and signaling to the market the importance of business continuity (B3, 2025).

In recent years, there has been a growing interest in the ESG issues by the Brazilian financial market. According to Anbima (2022), this trend has stimulated adaptations in the investment fund sector. Research conducted by Morningstar and Capital Reset revealed that, in 2020 alone, ESG funds raised R\$ 2.5 billion, with half of this amount coming from funds created that same year (Global Compact, 2025).

As a regulatory response, since 2022 Anbima has required the identification of investment funds whose strategy is fully oriented towards sustainability. For this, the suffix 'IS' is used to identify funds involved with sustainable investments. Funds that incorporate only some ESG aspects, without having them as the central focus, are prevented from using this classification. This measure reinforces the pursuit of greater transparency and standardization in the Brazilian national market, which is still consolidating compared to the more mature practices observed in other regions of the World.

2.3 Hypothesis formulation

The ESG criteria investigated in the context of investment funds present heterogeneous results depending on the regional context. Plagge and Grim (2020), when analyzing North American funds, find substantial cross-sectional dispersion in performance among funds, and the absence of consistent generation of significant alpha after controlling for style factors. Similarly, Kuzmina *et al.* (2023) examine European ESG funds in the energy sector and claim that ESG equity funds do not show a statistically significant difference from the non-ESG equity funds in most periods examined. These authors highlight that the factor of sustainability has a non-significant and negative effect on the fund performance, and in some cases, ESG funds had lower returns than conventional ones, partly due to the predominance of exclusion strategies in asset selection.

Recent reports from Morgan Stanley indicate that, in the second half of 2024, sustainable funds underperformed traditional funds, with average returns of 0.4% versus 1.7%, a result mainly explained by greater exposure to European and global markets, which underperformed the Americas and Asia-Pacific regions; even so, ESG funds focused on these latter regions have outperformed their conventional peers (Morgan Stanley Institute, 2025). On the other hand, studies in other markets present more positive findings: Tang *et al.* (2025) found that, in China, ESG funds outperformed traditional funds by 1.2% in risk-adjusted excess returns, suggesting that well-structured ESG integration strategies can bring financial gains.

An important issue is the degree of effective commitment of these funds to the sustainable agenda. Raghunandan and Rajgopal (2022), when analyzing U.S. funds, found that many ESG funds hold companies with worse environmental and labor records than non-ESG funds managed by the same institutions, in addition to charging higher fees. This finding reinforces that, in many cases, the adoption of ESG labeling does not translate into investment practices effectively aligned with sustainability, which raises questions regarding greenwashing and low consistency (Dmuchowski *et al.*, 2023).

In Brazil, the literature also points to mixed results. Silva, Oliveira and Pessina (2025) showed that the majority of Brazilian ESG funds, especially equity funds, perform poorly, rarely surpassing benchmarks such as the CDI and Ibovespa, which becomes even more evident in funds with explicit sustainability goals. On the other hand, Guimarães and Malaquias (2023) concluded that, on average, Brazilian ESG/SRI funds show risk-adjusted performance similar to conventional ones, but that, in periods of crisis, such as the COVID-19 pandemic, they proved to be more resilient, earning a superior performance. Similar results were found by Pisani and Russo (2021), who highlighted the greater capacity of European ESG funds to withstand financial contagion risks during the COVID-19 pandemic, reinforcing the protective role of these portfolios in instability scenarios.

Given that in the Brazilian context, the literature also points to mixed evidence: while some studies identify lower or similar performance compared to traditional funds, others highlight greater resilience in periods of crisis. According to the set of evidence described already stated before, the hypothesis can be decided as follows:

H1: There exists a statistically significant difference between the performance of ESG funds and traditional funds in the Brazilian market, considering risk-adjusted return measures.

3 Methodological Procedures

This is a quantitative study, using an empirical-analytical approach. The main purpose is to analyze the financial performance of investment funds with ESG characteristics and traditional ones. As for the sampling technique, we perform documentary research in a secondary data of ESG funds and traditional funds of the Brazilian market selected through the Economática software.

The following criteria were applied to compose the sample: (1) classification by the Brazilian Securities and Exchange Commission restricted to the ESG "equity" funds; (2) current status of the fund defined as "in operation"; (3) minimum net equity of R\$ 10 million; and (4) classification regarding the adoption of ESG criteria, including both funds identified as "yes" (ESG funds) and "no" (non-ESG funds), excluding those categorized as "related".

By applying these filters, we composed a sample of 3,502 non-ESG funds and 35 ESG funds. We emphasize that, since the analysis is based on central tendency statistics, especially the mean, the discrepancy in group size does not compromise the validity of the results. The analysis period spanned from April 2006 to March 2026, taking as a starting point the publication of the Principles for Responsible Investment [a relevant milestone for the dissemination of ESG practices in the financial market], with the end point corresponding to the data collection period.

The performance of the funds was evaluated using the Sharpe Ratio, calculated according to Expression I:

$$S = \left(\frac{R_p - R_f}{\sigma_p} \right) - 1 \quad (\text{I})$$

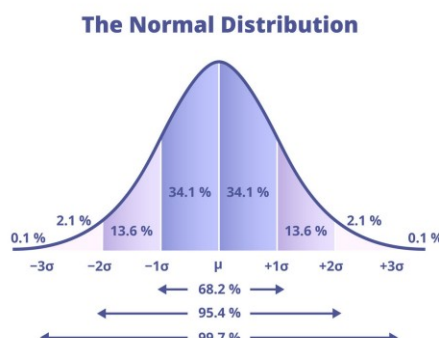
Where R represents the Sharpe Ratio, R_p corresponds to the average return of the fund, R_f is the risk-free rate, and σ_p is the standard deviation of returns, used as a measure of risk. In line with common practice in the Brazilian capital market (Silva & Pessina, 2025), we adopted the Selic rate as the risk-free rate benchmark. This index allows for the evaluation of excess return obtained per unit of risk taken and is widely used in the Brazilian literature for risk-adjusted performance analysis (Borges & Malaquias, 20219; Milona, Rompotis & Moutzouris, 2022; Silva & Iquiapaza, 2017).

The computation of the return of the funds analyzed funds was carried out based on the variation in the value of the shares between two consecutive periods, according to Expression II:

$$R = \left(\frac{x_t}{x_{t-1}} \right) - 1 \quad (\text{II})$$

Where, R represents the fund's return for the period, x_t corresponds to the unit value at the final period and x_{t-1} to the unit value at the initial period.

For the inferential analysis, we apply Student's t-test for independent samples to verify the existence of statistically significant differences in risk-adjusted performance between the groups. We chose not to perform formal tests of normality, based on the Central Limit Theorem, which states that, for sufficiently large samples, the distribution of the sample mean tends toward normality (Barros & Mazucheli, 2005). We conducted the tests with a significance level of 5% ($\alpha = 0,05$) and with a two-sided approach, according to established practice in the statistical literature (Giannopoulos *et al.*, 2022; Guimarães & Malaquias, 2023; Silva & Iquiapaza, 2017).



Initially, we applied the t-test assuming the equality of variances. However, given the possibility of heteroscedasticity, we also used Welch's t-test, which does not assume equality of variances and is considered more robust in contexts of unequal variances and different sample sizes. In addition, we also performed analysis of variance (ANOVA), including its robust version (Welch's F-test), as a complementary way to verify the consistency of the results in the presence of heteroscedasticity. The statistical analyses were performed using the EViews software.

4 Analysis and Discussion of Results

Figure 1 shows the result of the Sharpe Ratio for the period under study

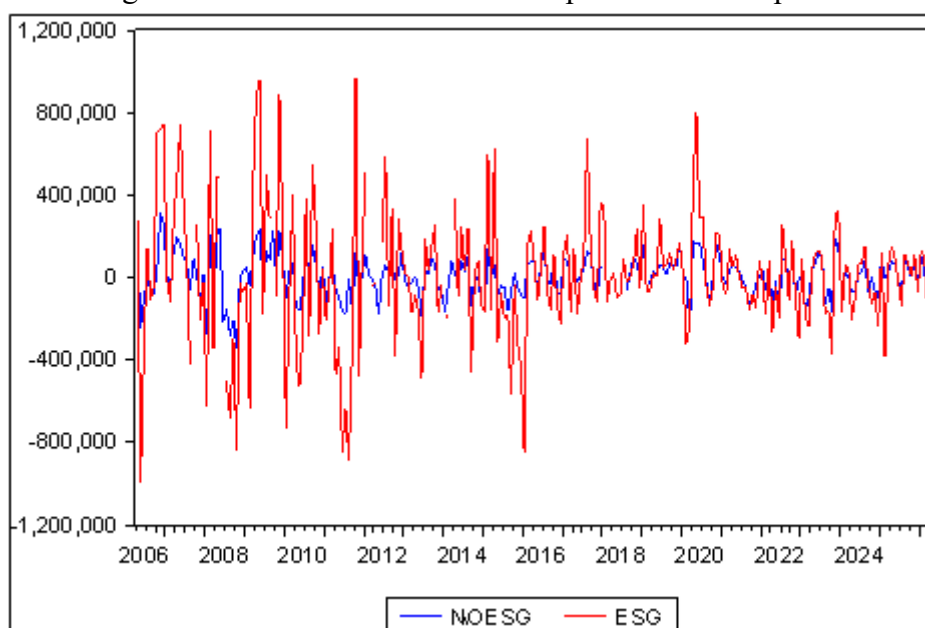


Figure 1 Evolution of the Sharpe Ratio for ESG and non-ESG funds (2006-2026)

Source: Research data (2026).

The results presented in Figure 1 show that the risk-adjusted performance of ESG and non-ESG funds exhibits high variability over time, without a consistent pattern of superiority or inferiority between the groups. This behavior is consistent with the literature that points to the heterogeneity of results associated with ESG investments, indicating that the performance of these funds does not follow a uniform pattern over time (Plagge & Grim, 2020).

Higher volatility is observed in ESG funds, especially in the initial periods, while traditional funds show more stable behavior. This result can be partially explained by sample composition effects. At the beginning of the series, the reduced number of ESG funds makes the average Sharpe ratio more sensitive to extreme values, increasing the variability of the results. As the number of funds grows over time, especially from 2018/2019 and with greater consolidation after 2021, a reduction in volatility is observed, which reflects a broader and more representative sample base.

This factor suggests that some of the differences observed between ESG and non-ESG funds may be associated not only with intrinsic performance, but also with the evolution of the sustainable fund industry itself during the analyzed period. Furthermore, the higher volatility observed in ESG funds may be related to structural limitations in the construction of these portfolios, such as restrictions in asset selection or less diversification, as suggested by Kuzmina *et al.* (2023), which could negatively impact risk-adjusted performance.

Taken together, these visual findings reinforce the existence of differences in the Sharpe ratio behavior between the two types of funds, even though these differences do not show a uniform direction over time. The results shown in Table 1, indicate that ESG funds have, on average, a higher Sharpe ratio than non-ESG funds (11,270.84 versus 6,233.18). However, it is observed that ESG funds also exhibit substantially greater variability, with a significantly higher standard deviation (326,689.8 compared to 107,224.4), which suggests greater dispersion and instability in the risk-adjusted performance of this group.

Table 1

Descriptive analysis of the Sharpe ratio of ESG and non-ESG funds

Group	N	Mean	Standard Deviation	Standard Error of the Mean
non-ESG	233	6,233.18	107,224.40	7,024.50
ESG	233	11,270.84	326,689.80	21,402.16

Source: Research data (2026).

This result differs from what is argued in the literature, according to which the incorporation of ESG practices implies more stable financial performance over time (Friede, Busch & Bassen, 2015). However, the Morgan Stanley Institute study (2025) reported that, in the second half of 2024, sustainable funds presented lower average returns (0.4%) compared to traditional funds (1.7%), mainly attributed to greater exposure to European and global markets, which underperformed the Americas and Asia-Pacific, indicating that the difficulty in generating competitive returns by ESG funds is not exclusive to Brazil, but reflects a trend observed in different regions of the World.

In analytical inferential terms, the results of the mean difference tests reinforce this interpretation.

Table 2

Test of the difference in mean Sharpe ratio between ESG and non-ESG funds

Test	Statistics	Degrees of freedom	p-value	Result
T-test (equal variances)	-0.2236	464	0.8231	Not significant

Welch's t-test	-0.2236	281.41	0.8232	Not significant
ANOVA (F)	0.05	(1; 464)	0.8231	Not significant
Welch's F Test	0.05	(1; 281)	0.8232	Not significant

Note: Adopted significance level: 5% ($\alpha = 0,05$).

Source: Research data (2026).

The t-test for equality of means, as well as its robust version for unequal variances (Welch's test) and the analysis of variance (ANOVA), showed high p-values ($p \approx 0.82$), indicating no statistically significant difference between the groups at the conventional 5% significance level. Thus, there is not enough empirical evidence to reject the null hypothesis of equality of means between ESG and non-ESG funds.

Therefore, the research hypothesis formulated, which proposes the existence of a statistically significant difference in risk-adjusted performance between ESG funds and traditional funds, is not supported by the empirical results and should, therefore, be rejected in this study. These findings confirm those of Guimarães and Malaquias (2023) and Kuzmina et al. (2023), reinforcing the perspective that the performance of ESG funds, in the analyzed context, does not differ consistently from conventional funds, being subject to high variability and dependence on contextual factors. These results reinforce evidence that the relationship between ESG criteria and financial performance is heterogeneous and inconclusive.

5 Final considerations

The objective of this study was achieved through documentary research, in which we verified the performance difference between ESG and traditional funds in the Brazilian market, considering risk-adjusted return measures. To test our research hypothesis, we calculated the Sharpe Ratio and the difference in average risk-adjusted performance between ESG and non-ESG fund groups for the period from April 2006 to March 2026.

Given the purpose of this research, the results show a higher average Sharpe ratio in the ESG group. However, the high volatility and substantially higher standard deviation prevented the confirmation of this superiority through hypothesis testing. Thus, the research hypothesis formulated, which proposes the existence of a statistically significant difference in risk-adjusted performance between ESG funds and traditional funds, is not supported by the empirical results. We conclude, therefore, that the integration of ESG criteria in the analyzed context does not act as an isolated determinant of superior financial performance, being marked by heterogeneity that may reflect both structural diversification limitations and dependence on contextual and temporal factors.

We believe that the evidence found is of great value to researchers, students, and professionals interested in this issue. As a theoretical contribution, the results reinforce the heterogeneity evidenced in the literature and advance the understanding of the limits of integrating ESG criteria into investment strategies, especially regarding risk-adjusted performance. The absence of a statistically significant difference between ESG and traditional funds indicates that the adoption of these criteria does not necessarily imply an improvement in risk-return efficiency, with their effects being conditioned by contextual factors. As a practical contribution, the greater variability observed in ESG funds suggests lower stability, indicating that their evaluation should consider not only average performance but also the consistency of results. In this sense, the findings point to the need for investment decisions based on multiple criteria, as well as for the improvement of management strategies and the strengthening of transparency and standardization in the ESG market.

Among the study's limitations, the exclusive use of the Sharpe ratio stands out, which may restrict the assessment of risk-adjusted performance to a single metric. The focus on the Brazilian market limits the generalizability of the findings.

Given these limitations, for future research we suggest replicating this study, considering the analysis by using multiple risk-adjusted performance metrics, as well as investigating different economic cycles. Additionally, incorporating control variables related to fund characteristics could contribute to a more robust analysis.

Finally, studies that qualitatively consider the perception of managers and investors regarding the balance between financial return and socio-environmental impact are also needed.

References

- Agarwal, B., Gautam, R. S., Jain, P., Rastogi, S., Bhimavarapu, V. M., & Singh, S. (2023). Impact of environmental, social, and governance activities on the financial performance of Indian health care sector firms: Using competition as a moderator. *Journal of Risk and Financial Management*, 16(109). <https://doi.org/10.3390/jrfm16020109>
- Amin, N., & Tauseef, S. (2022). Does an optimal ESG score exist? Evidence from China. *Macroeconomics and Finance in Emerging Market Economies*. <https://doi.org/10.1080/17520843.2022>.
- Anbima. (2022). *ESG Guide II*. https://www.anbima.com.br/data/files/08/E7/AC/BC/8B54181056C3B2186B2BA2A8/ESG_Guide_II.pdf
- B3 – Brasil, Bolsa, Balcão. (2025). *O que é o ISE*. <https://iseb3.com.br/o-que-e-o-ise>
- Borges, D. M., & Malaquias, R. F. (2019). Restrições de resgate em fundos de ações, liquidez dos ativos e desempenho. *Revista de Administração de Empresas*, 59, 43-56. <http://dx.doi.org/10.1590/S0034-759020190105>
- Borsatto, A. L., Baggio, D. K., & Brum, A. L. (2023). Conceitos e definições do ESG – Environmental, social and corporate governance – no contexto evolutivo da sustentabilidade. *Desenvolvimento em Questão*, 21(59), e13493. <https://doi.org/10.21527/2237-6453.2023.59.13493>
- Campagnolla, C., & Macêdo, M. M. C. (2022). Revolução verde: passado e desafios atuais. *Cadernos de Ciência & Tecnologia*, 39(1), e26952. <https://doi.org/10.35977/0104-1096.cct2022.v39.26952>
- Conover, W. J. (1971). *Practical nonparametric statistics*. New York, NY: John Wiley & Sons.
- Dmuchowski, P., Dmuchowski, W., Baczewska-Dąbrowska, A. H., & Gworek, B. (2023). Environmental, social, and governance (ESG) model; impacts and sustainable investment–Global trends and Poland's perspective. *Journal of Environmental Management*, 329, 117023.
- Elkington, J. (2004). Enter the triple bottom line. In A. Henriques & J. Richardson (Eds.), *The triple bottom line: Does it all add up?* (pp. 1–16). London, UK: Earthscan.
- Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5(4), 210–233. <https://doi.org/10.1080/20430795.2015.1118917>
- Giannopoulos, G., Fagernes, R. V. K., Elmarzouky, M., & Hossain, K. A. B. M. A. (2022). The ESG disclosure and the financial performance of Norwegian listed firms. *Journal of Risk and Financial Management*, 15(6), 237. <https://doi.org/10.3390/jrfm15060237>
- Giese, G., Lee, L. E., Melas, D., Nagy, Z., & Nishikawa, L. (2021). Foundations of ESG investing: How ESG affects equity valuation, risk, and performance. *The Journal of Portfolio Management*, 47(3), 69–83. <https://doi.org/10.3905/jpm.2019.45.5.069>
- Gil, A. C. (2017). *Métodos e técnicas de pesquisa social* (7ª ed.). São Paulo, SP: Atlas.
- Global Sustainable Investment Alliance (2020). *Global Sustainable Investment Review 2020*.
- González-Estrada, E., & Cosmes, W. (2019). Shapiro–Wilk test for skew normal distributions based on data transformations. *Journal of Statistical Computation and Simulation*, 89(17), 3258–3272. <https://doi.org/10.1080/00949655.2019.1600226>

- Grim, D. M., and Plagge, J-C. (2022). A framework for ESG decision-making. *Vanguard research Commentary*. <https://www.vanguard.co.uk/content/dam/intl/europe/documents/en/a-framework-for-esg-decision-making-eu-en-pro.pdf>
- Guimarães, T. M., & Malaquias, R. F. (2023). Desempenho de Fundos de Ações considerando Investimentos ESG, Restrições Financeiras e a Pandemia COVID-19. *Brazilian Business Review*, 20(1), 18-37. <https://doi.org/10.15728/bbr.2023.20.1.2.pt>
- Instituto Brasileiro de Governança Corporativa. (2023). *Conheça os cinco princípios da governança corporativa*. São Paulo, SP: IBGC.
- KPMG. (2023). *Código das melhores práticas de governança corporativa*. <https://midia.kpmg.com.br/comunicados/images/2023/760624247.pdf>
- Kuzmina, J., Atstaja, D., Purvins, M., Baakashvili, G., & Chkareuli, V. (2023). In Search of Sustainability and Financial Returns: The Case of ESG Energy Funds. *Sustainability*, 15(3), 2716. <https://doi.org/10.3390/su15032716>
- Levine, D. M., Berenson, M. L., & Stephan, D. F. (2016). *Estatística: Teoria e aplicações*. (7ª ed.). Rio de Janeiro, RJ: LTC.
- Li, T. T., Wang, K., Sueyoshi, T., & Wang, D. D. (2021). ESG: Research progress and future prospects. *Sustainability*, 13(21), 11663. <https://doi.org/10.3390/su132111663>
- Milonas, N. T.; Rompotis, G. G.; Moutzouris, C. The Performance of ESG Funds vis-à-vis Non-ESG Funds. *Journal of impact and ESG investing*, 2(4), 96–115. <https://doi.org/10.3905/jesg.2022.1.041>.
- M. W., & Wasiuzzaman, S. (2021). Environmental, social and governance (ESG) disclosure, competitive advantage and performance of firms in Malaysia. *Cleaner Environmental Systems*, 2, 100019. <https://doi.org/10.1016/j.cesys.2021.100019>
- Morningstar. (2020). *ESG funds setting a record pace for launches in 2020*. <https://www.morningstar.com/funds/esg-funds-setting-record-pace-launches-2020>
- Morgan Stanley Institute for Sustainable Investing. (2025). *Sustainable reality: 2024 semi-annual insights*. Morgan Stanley. <https://www.morganstanley.com/ideas/sustainable-funds-performance-2024>
- Pacto Global – Rede Brasil (2025). *ESG*. <https://www.pactoglobal.org.br/esg/>
- Pereira, A. C., Silva, G. Z., & Carbonari, M. E. E. (2017). *Sustentabilidade, responsabilidade social e meio ambiente*. São Paulo, SP: Saraiva Educação.
- Pisani, F., & Russo, G. (2021). Sustainable Finance and COVID-19: The Reaction of ESG Funds to the 2020 Crisis. *Sustainability*, 13(23), 13253. <https://doi.org/10.3390/su132313253>
- Plagge, J-C., & Grim, D. M. (2020). Have investors paid a performance price? Examining the behavior of ESG equity funds. *The Journal of Portfolio Management*, 46(3), 123-140. DOI: 10.3905/jpm.2020.46.3.123
- PRI. (2025). About the PRI. <https://www.unpri.org/about-us/about-the-pri>
- PRI Association. (2019). *Princípios para o investimento responsável (PRI)*. Principles for Responsible Investment. London: PRI. https://dwtyzx6upklss.cloudfront.net/Uploads/e/g/l/pri brochure_portuguese2019_256030.pdf
- Gibson, R., Glossner, S., Krueger, P., Matos, P., & Steffen, T. (2022). Do responsible investors invest responsibly? *Review of Finance*, 26(6), 1389–1432. <https://doi.org/10.1093/rof/rfab066>

- Sharpe, W.F., 1966. *Mutual fund performance*. The Journal of Business, 39(1), pp.119–138.
- Sharpe, W.F., 1994. *The Sharpe ratio*. Journal of Portfolio Management, 21(1), pp.49–58.
- Silva, D. C. D., Oliveira, T. D. M. C., & Pessina, M. E. H. (2025). Evolução dos fundos ESG no Brasil. *RDE-Revista de Desenvolvimento Econômico*, 1(55).
<http://dx.doi.org/10.36810/rde.v1i55.9175>
- Silva, S.S., & Iquiapaza, R.A. (2017). Fundos de Investimentos Socialmente Responsáveis e Fundos Convencionais: Existem Diferenças de Desempenho? *Revista Evidenciação Contábil & Finanças*, 5(3), p.4-21. <http://periodicos.ufpb.br/ojs2/index.php/recfin>
- Tang, T., Guo, J., Zuo, L., & Lu, L. (2025). ESG fund performance and fund manager trading strategy: Evidence from China. *Global Finance Journal*, 101167.
<https://doi.org/10.1016/j.gfj.2025.101167>
- United Nations. (1972). *Declaration of the United Nations Conference on the Human Environment*. Stockholm: UN Conference on the Human Environment.
- United Nations. (1987). *Report of the World Commission on Environment and Development: Our Common Future*. Oslo: World Commission on Environment and Development.
- United Nations. (2025). (2025). *The Sustainable Development Goals Report 2025*. New York: United Nations Department of Economic and Social Affairs.
<https://unstats.un.org/sdgs/report/2025/The-Sustainable-Development-Goals-Report-2025.pdf>
- Voltolini, r. *Vamos falar de ESG?: provocações de um pioneiro em sustentabilidade empresarial*. [s. L.]: Editora Voo, 2021.
- Whelan, T., Atz, U., Van Holt, T., & Clark, C. (2020). *ESG and financial performance: Uncovering the relationship by aggregating evidence from 1,000 plus studies published between 2015-2020*. NYU Stern Center for Sustainable Business.