Lisbon School of Economics & Management
Universidade de Lisboa

MASTERS IN MANAGEMENT (MIM)

MASTERS FINAL WORK

DISSERTATION

THE IMPACT OF ESG COMPLIANCE ON REITs PERFORMANCES

RICCARDO POZZI

JANUARY – 2025

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ABSTRACT

This thesis provides a thorough examination of the financial and operational advantages linked to sustainability practices while examining the effect of Environmental, Social, and Governance (ESG) compliance on the performance of Real Estate Investment Trusts (REITs). The study uses econometric models to assess the correlation between ESG scores and important performance indicators, such as Net Asset Value (NAV), Funds From Operations (FFO), and Return on Assets (ROA), based on a dataset that spans 15 years and includes 181 REITs from various countries. The results show that ESG compliance has a beneficial impact on REIT performance, with governance benefits taking time to manifest while environmental and social factors drive financial stability and efficiency. ESG's strategic significance in investments is further supported by the fact that its advantages are most noticeable in the short to medium term.

GLOSSARY

AFFO = Adjusted Funds From Operations.
CRE = Commercial Real Estate.
CSR = Corporate Social Responsibility.
D/E = Debt-to-Equity.
ESG = Environmental, Social, and Governance.
FE = Fixed-Effects Regression.
FFO = Funds From Operations.
GRESB = Global Real Estate Sustainability Benchmark.
HESGL = High ESG Scores Minus Low ESG Scores.
LEED = Leadership in Energy and Environmental Design.
NAV = Net Asset Value.
NOI = Net Operating Income.
RE = Random-Effects Regression.
REITs = Real Estate Investment Trusts.
ROA = Return on Assets.
SASB = Sustainability Accounting Standards Board.
SEC = Securities and Exchange Commission.
TCFD = Task Force on Climate-related Financial Disclosures.

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INTRODUCTION

In recent decades, the global real estate industry has been significantly impacted by macroeconomic factors, changing investor preferences, and legislative developments. The emergence of Environmental, Social, and Governance (ESG) issues has become a crucial component of these, changing investment strategies and the standards by which success is measured. Real Estate Investment Trusts (REITs), which are crucial in connecting investors with commercial real estate assets, have made ESG compliance more important. This thesis investigates how sustainability policies affect financial results and operational efficiencies, examining the relationship between ESG compliance and REIT performance.

Sustainability issues are closely related to the real estate industry. The sector is under pressure to implement more sustainable practices since buildings account for a significant portion of global energy consumption and greenhouse gas emissions. Market dynamics are also changing as a result of strong governance frameworks and social expectations for corporate responsibility. ESG compliance has changed from being a feature that adds value to being a must for REITs, which are a special way to democratize real estate investing. This change is indicative of a larger trend in the capital markets, where investors are giving ethical and sustainable business practices more weight when making decisions.

Understanding the observable effects of ESG activities on REIT performance, both financially and operationally, is what inspired this study. The advantages of corporate social responsibility initiatives, environmental certifications, and governance reforms are demonstrated by the literature now in publication. There are also gaps in the comprehensive assessment of how these variables interact to affect REIT-specific metrics like return on assets, funds from operations, and net asset value. Furthermore, a more comprehensive examination of the temporal dynamics of ESG practices, particularly the initiatives' delayed impact, is required to provide investors and policymakers with relevant information.

This thesis analyses REITs in several regions using a methodological framework and a dataset that spans 15 years. This study attempts to offer a nuanced understanding of the ESG-REIT relationship by investigating lagged effects and using econometric methods like fixed-effects regressions. It specifically looks at the theory that both the total ESG score and each of its constituent parts significantly improve REIT performance metrics. The results provide useful implications for stakeholders looking to match financial performance with ESG goals and add to the expanding corpus of research on sustainable finance.

The thesis explores the nature and structure of REITs, how ESG principles are incorporated into the real estate market, and a review of previous research to put the findings in perspective in the upcoming chapters. A comprehensive analysis of the findings is then presented after the data and methodology have been described. The study's thorough methodology highlights the strategic significance of ESG compliance for REITs and offers a road map for utilizing sustainability as a catalyst for long-term wealth generation.

LITERATURE REVIEW

The interplay between macroeconomic factors and REIT-specific characteristics shapes REIT performance. When taken as a whole, these elements provide a strong foundation for understanding the intricate relationships that influence REIT performance both now and in the future. The macroeconomic climate shapes the larger context in which REITs function and affects their financial results.

Because interest rates have a direct impact on borrowing costs, they are one of the most important factors influencing REIT success. Due to their heavy reliance on debt funding for operations and acquisitions, REITs are especially vulnerable to fluctuations in interest rates. Interest rate increases make borrowing more expensive, which raises the cost of paying off current debt and lowers profitability. Additionally, investors find alternative fixed-income investments, such bonds, which offer higher yields with reduced risk, more appealing than REITs due to rising interest rates. Studies by Allen (2000) and Glascock (2002) have provided ample evidence of the negative relationship between interest rates and REIT returns, demonstrating that rising rates tend to reduce the net asset value (NAV) of REITs, lowering their dividend yields and making them less competitive when compared to alternative investment vehicles. On the other hand, declining interest rates make borrowing less expensive, increasing profitability and valuations and increasing investor interest in REITs. This vulnerability to changes in interest rates emphasizes how crucial it is to manage leverage well and keep flexible financing plans.

The relationship between inflation and REIT performance is more nuanced. Since property values and rental revenue typically increase during inflationary times, real estate is sometimes seen as a healthy hedge against inflation. REITs can boost property rentals as inflation rises, which will improve their profits. However inflation also raises the cost of property maintenance, including labour, material, and energy prices. The revenue advantages from higher rents can be negated by these higher operating costs, which could lower overall profitability. Additionally, in response to inflation, central banks usually raise interest rates, which worsens the impact of inflation on REITs by raising the cost of borrowing and lowering profitability. There are conflicting findings from empirical research on the connection between inflation and REIT success. While some studies, such as those by Chan et al. (1990) and Payne (2003), indicate a positive correlation between inflation and REIT returns, other studies, like those by Lu and So (2001), contend that because of the volatility of their returns during periods of high inflation, REITs may not be suitable inflation hedges. This conflicting data shows that the impact of inflation on REIT performance may vary depending on a number of variables, including the properties' geographic location, the kind of real estate they own, and the REIT's cost-controlling capabilities.

The performance of REITs with global exposure is also impacted by foreign exchange rates. Since foreign assets appreciate in value when translated back to the home currency, REITs that own them typically profit from a stronger domestic currency. A weaker home currency, on the other hand, may make foreign assets less valuable, which would lower a REIT's total net asset value. For REITs with an internationally diversified portfolio or those operating in areas with significant currency volatility, this sensitivity to exchange rate swings is particularly crucial.

For instance, studies by Muller and Verschoor (2006) and Ngo (2017) demonstrate that currency rate fluctuation adds extra risks, especially for industries like healthcare and industrial real estate that are frequently spread across multiple nations. Exchange rate swings continue to be a major aspect that can have a considerable impact on REITs' performance, even if they may employ hedging measures to reduce some of this risk.

Internal factors that significantly affect performance on a REIT-specific level include size, dividend yield, net income, and leverage.

During times of economic expansion, leverage, or the debt-to-equity ratio, can increase profits since it allows REITs to use borrowed money to buy more properties. However it also dramatically raises financial risk, particularly when interest rates are increasing, or the economy is struggling. High leveraged REITs have to pay more to service their debt, which can hurt their bottom line and lower their net asset value. According to Allen et al. (2000), REITs with high levels of leverage typically perform worse than those with lower debt levels, highlighting the dangers of excessive leverage. A REIT's flexibility is further diminished by excessive debt, which makes it more difficult for it to react to shifting market conditions or take advantage of strategic possibilities. Highly leveraged REITs, which are especially susceptible to rising borrowing costs as interest rates rise, may put additional strain on performance. The literature consistently shows that there is a negative correlation between leverage and REIT performance, highlighting the significance of prudent debt management.

Since net income indicates how profitable a REIT's real estate holdings are, it is another important factor in determining REIT performance. An increase in net income directly raises NAV, which boosts the REIT's appeal to investors. According to research by Khan & Siddiqui (2019), net income and REIT performance are strongly positively correlated. In addition to increasing its capacity to pay dividends, a REIT with a high net income also has more retained earnings that can be used to fund further expansion. For REITs operating in markets with high margins or robust cost control, the ability to continuously produce positive net income is especially crucial since it shows operational efficiency and boosts investor confidence.

Since REITs are legally obligated to deliver at least 90% of their taxable revenue to shareholders, dividend yield is one of the most alluring factors to assess their success, and it is computed by taking the current share price and dividing it by the annual dividend payment. Because higher yields draw income-seeking investors, research by Mohamad & Zolkifli (2014) and Khan & Siddiqui (2019) indicates that REITs with greater dividend yields typically enjoy stronger NAV growth. Share prices may rise as a result of this increased demand, raising the REIT's overall valuation. High dividend yields can be advantageous in the short run, but it's crucial to remember that they can also limit long-term growth and have a negative impact on the REIT's performance in the future by reducing the amount of money available for reinvestment in improvements or property purchases.

Another important factor influencing performance is a REIT's size, which is frequently determined by its market capitalization. Economies of scale, which lower operating costs and increase profitability, are typically advantageous to larger REITs. Bigger REITs are usually better positioned in the market to weather economic ups and downs, can diversify their holdings more successfully, and have access to better financing arrangements. According to research by McIntosh et al. (1991) and Mohamad & Zolkifli (2014), larger REITs typically perform better than smaller ones because they are better equipped to control risk and embrace opportunities.

While smaller REITs could be more susceptible to market risks and economic fluctuations, larger REITs are better equipped to withstand market downturns due to their diversified portfolios, improved operational efficiency, and stronger market positioning. Because of this, size plays a significant role in assessing a REIT's overall stability and development potential.

Methodologies and Variables Used

Because fixed-effects regression isolates the effects of specific variables (such as net income, interest rates, and dividend yield) on REIT performance, while controlling for individual REIT characteristics that remain constant over time, researchers have consistently used econometric models to examine the impact of ESG factors on REITs. This allows them to account for both internal and external factors influencing performance. NAV, leverage, stock returns, and dividend yield are frequently examined dependent variables that offer information about the REIT's financial standing and investor attraction.

To further understand how ESG affects financial performance, Ngo (2017), for instance, employed fixed-effects models using ESG ratings as the independent variable and additional control factors including REIT size, leverage, and geographic diversification. In order to capture both cross-sectional changes and time-specific impacts, the studies frequently used panel data, which is a study of REITs over a number of time periods. Since it may take years for changes in environmental, social, or governance standards to show up in financial performance, this is especially useful for separating the effects of ESG issues on REITs. Environmental certifications, energy savings, CSR (corporate social responsibility) scores, and governance indicators like executive salary and board diversity are examples of independent variables that represent ESG practices, albeit they can differ. Each of these metrics aims to measure how well a REIT is implementing ESG practices and how those practices impact its financial performance.

Because green buildings with energy-efficient retrofits and renewable energy adoption have greater occupancy rates, lower vacancy rates, and lower operating costs, which increase NAV, environmental policies frequently result in superior financial outcomes for REITs. According to research by Brounen and Marcato (2018), investors and tenants are favouring sustainable properties more and more, which is improving stock prices and market performance as a whole. Furthermore, REITs are protected from potential fines and expenses by adhering to stricter environmental standards, and sustainable properties are more adaptable to changes in the economy, which increases their appeal to investors. In contrast to environmental factors, social aspects of ESG, such as CSR, employee welfare, and tenant participation, do not instantly show up in the financials. They frequently have a more indirect and qualitative effect. CSR initiatives have been shown to improve a REIT's overall brand reputation and tenant satisfaction, which in turn results in lower turnover and longer tenant retention, according to a study by Mohamad and Zolkifli (2014). These benefits help stabilize cash flows over the long term, though they don’t necessarily create a short-term boost to financial performance.

Because CSR initiatives usually don't yield immediate financial rewards, the direct financial impact of social factors is still less obvious than that of environmental or governance aspects, despite these strong links. However, research indicates that by strengthening stakeholder

interactions and fostering resilience against reputational hazards, they contribute significantly to risk mitigation.

Strategic decision-making that strikes a balance between immediate expenses and long-term success is one of the governance aspects. Institutional investors are attracted by companies with good governance because it lowers management risks and increases decision-making transparency. Strong governance procedures, such as guaranteeing board independence, boosting executive responsibility, and upholding stringent compliance requirements, eventually aid in lowering a REIT's cost of capital by boosting investor confidence, according to research by Brounen & Marcato (2018). This makes it easier for REITs to access financing for expansion or acquisitions, which boosts NAV and overall returns. The initial costs of adopting new governance policies often lead to temporary reductions in profitability due to the resources required for implementation. However, the long-term benefits outweigh these short-term costs, as governance reforms ensure REITs are better positioned to handle market volatility and regulatory changes.

Previous Studies on ESG Impact

Depending on the factor examined, in-depth study on how ESG affects REIT performance has produced different findings. Environmental factors have been the focus of numerous studies, which have found that REITs that use eco-friendly strategies typically outperform their counterparts. For instance, a study by Brounen and Marcato (2018) looked at REITs that had green certifications like as LEED and BREEAM. They found that these certificates had a favourable correlation with market-based metrics like stock returns as well as operational performance metrics like occupancy rates and rental income.

In their methodology, panel data regression models were employed to examine the effects of environmental performance scores, controlling for variables like property type and location, concluding that, environmental factors, particularly those related to energy efficiency and sustainability, create both operational cost savings and greater demand from tenants and investors, resulting in better financial performance.

Research on social topics, however, usually produces more nuanced findings. While tenant relations and employee welfare can improve a REIT's image, the short-term financial impacts are sometimes harder to quantify. The social components of ESG, such as CSR initiatives and community service, have an indirect impact on financial success by boosting tenant loyalty and lowering attrition, per research like those by Mohamad and Zolkifli (2014). However, there is less of a direct correlation between social issues and NAV or stock returns.

ESG projects don't yield results right away. According to a number of studies, such as those by Brounen and Marcato (2018) and Ngo (2017), the benefits of ESG practices, especially in the areas of governance and the environment, frequently take one to three years to manifest.

For example, green building certifications or energy-efficient retrofits may not instantly increase rental income or NAV growth, but they will eventually improve operational performance. Similarly, governance reforms, which increase investor confidence, tend to enhance market valuation in the long run, even though they may temporarily decrease profitability due to the costs associated with these changes. This delayed impact shows that ESG investments are fundamentally about long-term value creation, not short-term gains. As

investor awareness of ESG grows and more capital is directed toward sustainable investments, REITs that have established strong ESG practices are expected to benefit from increased market interest and higher valuations down the line.

Macroeconomic factors, characteristics unique to REITs, and increasingly ESG standards are all highly connected with REIT success. While external factors like interest rates, inflation, and foreign currency rates have an impact on the overall operating environment, internal factors like debt, net income, dividend yield, and size determine a REIT's resiliency and growth potential. The long-term benefits of sustainability-focused strategies are highlighted by the interesting fact that the benefits of ESG practices typically appear gradually. Prioritizing ESG initiatives puts REITs in a strong position for long-term profitability and resilience, as investor preferences and regulatory requirements are shifting in favour of ESG-compliant businesses. *(Morri et al. (2023))* Even though ESG has obvious long-term benefits, more research is needed to quantify the intricate financial impacts of social programs and look at how these aspects interact with broader market trends.

REITS: STRUCTURE, FUNCTION, AND TYPES

A REIT is a company that finances, owns, or manages real estate that generates revenue. Regular investors now have a rare opportunity to have access to substantial real estate portfolios through REITs, which give them a means of generating income without having to manage or own real estate directly. The goal of REITs, which were created in 1960 by US legislation, was to make real estate investing more accessible by facilitating investment in commercial real estate with the same accessibility as stocks.
Similar to mutual funds, Real Estate Investment Trusts pool the capital of multiple investors for the purpose of financing, managing, or buying real estate. With this structure, investors can participate in the gains made by real estate businesses, which are mostly distributed as dividends, without having to own or oversee the properties themselves. In order to keep their position as REITs, which is tightly regulated and requires them to fulfil certain requirements, they must continue to concentrate on investing in real estate and distributing income to shareholders. *(What's a REIT (Real Estate Investment Trust)?, n.d.)*

REITs operate using a straightforward business model: they manage, own, or finance real estate, and they distribute the majority of their profits to investors. The majority of REITs are equity-based, which means that they own and operate real estate with a focus on leasing as their main source of income. REITs have to comply with specific criteria set to maintain tax advantages and operate efficiently.
The key characteristics of REITs include:

- At least 75% of total assets must be invested in real estate or cash.
- At least 75% of their gross income must derive from real estate-related activities, such as rental income, interest on mortgages, or real estate sales. Specifically, at least 95% of gross income must come from real estate, dividends, or interest.
- REITs are required to distribute a minimum of 90% of their taxable income to shareholders annually.
- REITs operate as entities taxable as corporations and are managed by a board of directors or trustees.
- REIT shares must be fully transferable, with at least 100 shareholders within the first year, and no more than 50% of shares held by five or fewer individuals.
- Have no more than 25% of assets in non-qualifying securities or taxable REIT subsidiaries. *(Harper, 2024)*

These requirements allow REITs to benefit from significant tax advantages. As long as they share the majority of their income, REITs are typically immune from corporate income taxes, in contrast to ordinary firms that pay taxes on profits before paying dividends. REIT performance analysis typically focuses on dividend yield, income stability, and the quality of real estate assets, reflecting their unique structure and regulatory obligations.

Based on their investment kinds and business structures, REITs can be categorized into multiple types. The primary classifications are:

- Equity REITs: The most prevalent kind of REITs, these entities own and manage properties that generate revenue. Leasing buildings to tenants is their main source of income.
- Mortgage REITs (mREITs): Rather than being property owners, these REITs concentrate on financing real estate by buying or creating mortgages and mortgage-backed securities and collecting interest.
- Hybrid REITs: These REITs combine mortgage and equity REIT techniques to own properties and offer real estate financing. However, as REITs have been more specialized in recent years, this sector has grown less popular.
- Public non-listed REITs: These REITs are not traded on public exchanges, although they are registered with the SEC (Securities and Exchange Commission). Although they give access to real estate assets, their liquidity is not as great as that of publicly traded REITs.
- Private REITs: These REITs do not trade on public exchanges and are not SEC-registered. They usually have greater entrance restrictions and are only accessible to accredited investors. *(What Is Not a REIT?, n.d.)*

REITs have consistently generated competitive total returns by combining dividend income with capital growth. Because of their minimal relationship to other asset classes, they are helpful instruments for diversifying investment portfolios, which can help reduce total risk while preserving steady returns. REITs also have the benefit of liquidity. Unlike traditional real estate investments, which can be difficult to buy or sell quickly, publicly traded REITs give investors the same liquidity as stocks, making it simpler for them to enter and exit

positions. Furthermore, ordinary investors can now have exposure to large-scale real estate investments, such as office buildings, retail centres, or healthcare facilities, without having to pay the huge sums of money typically required to purchase such assets on their own.
Even though REITs have many advantages, there are hazards involved. Variations in interest rates, downturns in the real estate market, and changes in the economy can all affect the success of REITs. For example, income for equity REITs may drop during times of vacancy or when property prices drop. Additional risks associated with non-traded REITs include inadequate transparency and absence of liquidity. Non-traded REITs are harder to sell on the open market than publicly traded REITs, and because they don't regularly update their market prices, it can be difficult to assess their value. *(What's a REIT (Real Estate Investment Trust)?, n.d.)*

ESG COMPLIANCES IN REAL ESTATE MARKET

ESG, or environmental, social, and governance, is the acronym for the three primary factors that are used to evaluate the morality and long-term implications of investing in a company or sector. The concept has become quite popular since investors, consumers, and government organizations are now more conscious of the broader consequences of business actions. ESG compliance requires that businesses follow policies and procedures that ensure moral business conduct in the areas of social justice, environmental preservation, and good governance.
The environmental element focuses on how a company reduces its environmental impact. Initiatives to manage waste and water resources, reduce carbon emissions, and boost biodiversity are all included in this. The social component addresses issues including community involvement, diversity, labour legislation, and data privacy. Interactions between a company and its employees, customers, and the general public are also included. However, the governance component talks about how a company is managed, including issues like leadership, corporate ethics, shareholder rights, CEO pay, and transparency.
Because they affect investment decisions, business policies, and regulatory requirements, environmental, social, and governance factors are vital in the real estate industry.
According to the EU Taxonomy, REITs are essential to achieving the EU's sustainability objectives. Investors can evaluate sustainability performance and draw in fresh funding for eco-friendly initiatives by using the Taxonomy's clear methodology for evaluating how "green" a REIT's portfolio is. When developing, renovating, or purchasing buildings, REITs can use the EU Taxonomy to find and report on investments in energy-efficient assets. As real estate accounts for a significant portion of Europe's energy consumption, REITs are vital in driving the green transition by retrofitting existing properties to align with the EU's climate targets. REITs have the potential to revolutionize the built environment by emphasizing energy efficiency enhancements and long-term sustainable development, while also coordinating their investment strategies with the climate goals of the European Union.
Because of the considerable environmental footprint of buildings, the social importance of community-oriented planning, and the governance responsibilities tied to managing large-scale properties, the real estate industry plays a crucial role in advancing global ESG (Environmental, Social, and Governance) initiatives. In recent years, ESG compliance has gained increased

attention, particularly within Commercial Real Estate (CRE) portfolios. This is largely due to heightened investor demand for sustainable practices and evolving regulatory requirements. REITs, in particular, must navigate ESG obligations across three key areas: environmental, social, and governance compliance.

Climate change and carbon emissions are major issues from an environmental point of view. Since climate-related risks have the potential to physically damage properties, raise insurance premiums, and cause operational disruptions, the commercial real estate industry is under increasing pressure to lower its carbon footprint. As a result, companies are subject to more stringent energy-related laws that demand that they lower emissions and enhance reporting. Sustainability and energy efficiency are also major issues, and many CRE portfolios and REITs are working to obtain green building certifications like LEED and ENERGY STAR. These certifications improve long-term value and investor confidence in addition to adhering to legal requirements. Companies also need to manage transition risks, which include changes in market demand, energy supplies, and regulation, as well as physical hazards, including damage from severe weather. Tackling these risks helps ensure operational continuity and regulatory compliance. *(REIT ESG Dashboard, n.d.)*

Stakeholder involvement and community influence are crucial elements on the social front. This entails encouraging the welfare of tenants and making constructive contributions to the communities in which they live. Placemaking, or projects that enhance quality of life while maintaining financial viability, is an area in which REITs are increasingly investing. These initiatives could include making cheap housing available, improving building security, or making sure that projects have both social and financial benefits. Social compliance also includes labour management and human rights. Investors and regulators are becoming more interested in effective labour policies that put diversity, equity, and inclusion first. Human capital management, equitable pay, and worker diversity are now regarded as important business risks. Standards for health and safety come in second. *(REIT ESG Dashboard, n.d.)*

Regarding governance, corporate governance and transparency are the main points of emphasis. Effective leadership and transparent investor communications are essential components of real estate good governance. By creating board-level ESG committees, linking executive compensation to ESG performance, and coordinating reporting procedures with international frameworks such as the Task Force on Climate-related Financial Disclosures (TCFD) and the Sustainability Accounting Standards Board (SASB), REITs are progressively taking ESG into account in their governance models. In addition, ethical governance entails promoting diversity, especially in senior positions, guaranteeing open decision-making, and imposing stringent reporting guidelines. In order to foster confidence and lower operational risk, the real estate industry is aggressively enhancing governance procedures as stakeholder expectations continue to change. *(REIT ESG Dashboard, n.d.)*

REITs' approach to ESG compliance has changed significantly during the last ten years. What was formerly thought of as an add-on to business strategy is now a major consideration in both regulatory compliance and investment choices. The fact that 77% of the top 100 REITs by market capitalization had ESG-focused staff in 2021, a remarkable increase from the year before, was one glaring sign of this change. This significant rise is indicative of a larger industry-wide dedication to sustainability. When businesses lack internal ESG personnel, they

frequently depend on external consultants or internal committees to manage these programs. The broad use of international ESG standards has been another significant development. With 69 U.S.-based REITs presently participating, participation in standards such as the Global Real Estate Sustainability Benchmark (GRESB) has increased. Twenty-five of these have stood out by receiving ratings of four or five stars, which puts them in the top 40% of performers worldwide. This pattern demonstrates how ESG compliance has changed from being a side project to becoming a crucial differentiation in the marketplace.

ESG approach has also been significantly shaped by investor expectations. Investors now place a high premium on disclosures pertaining to financially significant ESG issues, especially those associated with climate risk. Because of this, more REITs are coordinating their reporting procedures with globally accepted frameworks like the Sustainability Accounting Standards Board (SASB) and the Task Force on Climate-related Financial Disclosures (TCFD).

This improvement is further supported by quantitative evidence. Over time, REITs have continuously enhanced their sustainability performance, according to GRESB. The number of REITs putting formal ESG policies into place has significantly increased, and they are also becoming more prevalent in voluntary disclosure programs like the Carbon Disclosure Project. These developments demonstrate how the industry is evolving its approach to ESG, moving from voluntary compliance to a strategic necessity. *(REIT ESG Dashboard, n.d.)*

Long-term success in the real estate market requires a commitment to ESG compliance that is no longer optional. To satisfy regulatory requirements, draw in investors, and guarantee sustainable growth, REITs and real estate businesses are making significant investments in adhering to environmental, social, and governance standards. There are several indications that ESG is becoming ingrained in the real estate industry, including the growth of specialized ESG employees, higher involvement in international standards like GRESB, and alignment with frameworks like TCFD and Global Reporting Initiative. As these procedures advance, they are changing the way the real estate sector functions and guaranteeing that real estate investments benefit the environment and society.

DATA AND METHODOLOGY

Variables Description

The dataset used in this study consists of 2,715 observations spanning a 15-year period from 2010 to 2024. Sourced from Bloomberg, it includes data on 181 companies, primarily based in the United States, but also representing countries such as Italy, Germany, France, Canada, Australia, the United Kingdom, Spain, and Belgium. The dataset features some of the largest publicly traded REITs in the world. A two-step procedure was used to choose the companies: first, businesses with a Return on Equity (ROE) more than 10% were found using Yahoo Finance data, including also businesses with high Environmental, Social, and Governance (ESG) rankings in addition to those without in order to further diversity the sample. Moreover, in order to provide a more thorough approach that is not influenced by the particular REIT industry, the dataset groups companies according to their primary type of use, including

Development, Diversified, Healthcare Facilities, Hotel & Motel, Industrial, Mortgage, Office, Residential, Retail, Services, and Specialty.

NAV, Funds From Operations (FFO), Adjusted Funds From Operations (AFFO), Net Operating Income (NOI), and Return on Assets (ROA) are the dependent variables examined in this study. An overview of the variables is provided below:

The most popular performance indicator for REITs is net asset value, which provides a clear picture of the REIT's asset and liability values. A higher net asset value indicates that the REIT's assets are increasing in value, which is frequently the consequence of successful acquisitions, growing property valuations, or efficient property management. When comparing the market values of REITs, NAV is especially helpful since it offers a standard by which to judge whether a REIT is trading at a premium or discount to its true asset value. While a falling NAV may indicate possible operational difficulties or bad market conditions, a strong NAV might draw investors looking for safe returns during times of economic stability.

FFO, which accounts for depreciation and excludes non-recurring profits like real estate transactions, gives a clear picture of the cash flow from core operations. Strong operational efficiency and steady income from real estate assets are indicated by a greater FFO, which is frequently the result of good management or advantageous market conditions. Because it represents the recurrent income available for distribution, it is especially helpful in assessing a REIT's capacity to maintain dividend payouts.

By taking into consideration ongoing capital expenditures, maintenance expenses, and rent changes, AFFO is an improved performance statistic for REITs that expands upon FFO. Because it accounts for the expenses required to manage and sustain its portfolio of properties, AFFO provides a more accurate assessment of a REIT's residual cash flow. Because it offers a more transparent picture of the cash available for distribution, this metric is especially helpful for assessing a REIT's ability to maintain and increase dividend payouts.

Because it gives a clear view of a property's cash flow before financing costs, NOI is a crucial indicator for assessing the profitability of income-generating real estate investments. A strong NOI signifies efficient operations and robust profitability, while a declining NOI can indicate operational inefficiencies or market challenges.

ROA is useful to measure a company's profitability providing insight into how efficiently it uses its resources to generate profits. A higher ROA indicates better asset utilization, while for REITs, which are asset-intensive, it is typically lower, under 5%.

Numerous financial and operational metrics are regarded as independent variables, including market capitalization, occupancy rate, debt-to-equity ratio, dividend yield, FFO payout ratio, capitalization rate, ESG score, and the individual ESG components (Environmental (E), Social (S), and Governance (G) scores). The most crucial variables are summarized as follows:

The debt-to-equity (D/E) ratio determines how much debt the REIT uses to finance its operations relative to its own resources. A high D/E ratio indicates increased reliance on debt, which can increase returns in good times but raise issues in poor ones. Conversely, a low D/E ratio may suggest careful funding, but it may also suggest that debt isn't being fully utilized for expansion. The D/E ratio is crucial for REIT investors to monitor since it demonstrates how growth potential and financial stability are matched.

This percentage of available space is known as the occupancy rate. When assessing the cash flow stability and property performance of REITs, as well as their general financial well-being

and capacity to sustain consistent revenue streams, this number is crucial. Effective utilization of the space and steady revenue generation are indicated by higher occupancy rates, but operational challenges or low market demand may be indicated by lower rates.
The FFO payout ratio shows what proportion of a company's profits are paid out as dividends to shareholders. It is stated as a percentage of funds from operations per share. Payout ratios below 100% suggest that a business is reinvesting most of its profits for expansion, whereas payout ratios above 100% may indicate that dividends are being paid from reserves, which may not be sustainable over time. Ethical and sustainable business practices are evaluated using the ESG score. Using data from the Bloomberg database, the score used in this research ranges from 0 for companies who don't publish any ESG data to 100 for those that do. The same set of subjects, data fields, and field weights are used across industries and regions. However, the majority of the themes and data categories that comprise the score were chosen using sector-agnostic frameworks. By giving the Environmental (E), Social (S), and Governance (G) pillars equal weight, the total ESG Disclosure Score is determined. Without analysing the company's performance according to any particular standards, this score evaluates the quantity of ESG data that the business makes publicly available.
The total score represents the independent influence of each typology of practice, which is better assessed using the E, S, and G ratings. An index discusses each pillar separately. The combined Environmental (E), Social (S), and Governance (G) scores evaluate a company's transparency and disclosure practices across key ESG areas. Instead of focusing on actual performance, the Environmental score represents transparency and places an emphasis on conformance to international norms. It is predicated on how well-reported data on ecological impacts, resource efficiency, and greenhouse gas emissions is. The Social score evaluates how well the business handles topics like diversity, labor practices, and social impact by looking at disclosures on workforce management, community involvement, and consumer responsibility. The Governance score places emphasis on the quality and transparency of disclosures when assessing governance practices, including as CEO compensation, shareholder rights, board composition, and audits. Even if the significance of governance varies from business to business, leadership and accountability must constantly be evaluated.

Methodology

In order to capture both cross-sectional (variations between companies) and longitudinal (variations over time) impacts, the research employs a panel data methodology. This framework takes into consideration the individual variances amongst 181 organizations and enables an analysis of their performance and features over a 15-year period.
Before the analytic procedure starts, the values are subjected to a z-scale correction. Each value in the dataset is scaled by subtracting the mean and dividing the result by the standard deviation in order to normalize and make the data more comparable. This makes it possible to show the connections between each variable more clearly.
The choice of the regressions to be implemented is taken according with previous studies and existing literature *(Morri et al., 2024)*. The study begins with the application of fixed-effect (FE) and random-effect (RE) regression models to explore the impact of the independent variables on each dependent variable. For each regression, the Hausman test is used to determine whether the individual effects in the model are correlated with the explanatory

variables; if the null hypothesis is rejected, it means that the RE estimator is biased and inconsistent, making the FE estimator the better option even though it is less efficient; the test is based on the fact that the FE estimator is consistent regardless of correlation, whereas the RE estimator is valid only if there is no correlation. The result of the test indicates that the fixed-effect model is generally more suitable, as it captures within-company variations over time more effectively, even if there are not substantial differences both in coefficients and significance level between the employment of fixed effects model and the random effects model (*Appendix*, *Table 7.0 to 7.3*). The exceptions, for which the random-effect model is deemed more appropriate, occurred in the regressions where the dependent variable is NOI, and the independent variables are, in addition to the others, the Environmental (E) score, Social (S) score, and Governance (G) score, respectively.

Hypothesis n.1 model (H1):

$$PI_{i,t} = \beta_0 + \beta_1 TU_{it} + \beta_2 CR_{it} + \beta_3 DE_{it} + \beta_4 DY_{it} + \beta_5 FPR_{it} + \beta_6 MC_{it} + \beta_7 OR_{it} + \beta_8 ESG_{it} + \alpha_i + \varepsilon_{it}$$

Where:

i	*company specific indicator*
t	*time specific indicator (years)*
PI	*performance idicator*
β	*coefficients of the independent variables*
TU	*type of use (predominant destination of use of the assets)*
CR	*capital rate*
DE	*debt to equity ratio*
DY	*dividend yield*
FPR	*FFO payout ratio*
MC	*market capitalization*
OR	*occupancy rate*
ESG	*ESG score*
αi	*entity-specific fixed effects (capturing unobserved heterogeneity).*
εit	*idiosyncratic error term.*

Hypothesis n.2 model (H2):

$$PI_{i,t} = \beta_0 + \beta_1 TU_{it} + \beta_2 CR_{it} + \beta_3 DE_{it} + \beta_4 DY_{it} + \beta_5 FPR_{it} + \beta_6 MC_{it} + \beta_7 OR_{it} + \beta_8 E_{it} + \alpha_i + \varepsilon_{it}$$

Where:

E	*environmental specific score*
the other independent variables are the same as H1	

Hypothesis n.3 model (H3):

$$PI_{i,t} = \beta_0 + \beta_1 TU_{it} + \beta_2 CR_{it} + \beta_3 DE_{it} + \beta_4 DY_{it} + \beta_5 FPR_{it} + \beta_6 MC_{it} + \beta_7 OR_{it} + \beta_8 S_{it} + \alpha_i + \varepsilon_{it}$$

Where:

S	*social specific score*
the other independent variables are the same as H1	

Hypothesis n.4 model (H4):

$$PI_{i,t} = \beta_0 + \beta_1 TU_{it} + \beta_2 CR_{it} + \beta_3 DE_{it} + \beta_4 DY_{it} + \beta_5 FPR_{it} + \beta_6 MC_{it} + \beta_7 OR_{it} + \beta_8 G_{it} + \alpha_i + \varepsilon_{it}$$

Where:

G	*governmental specific score*
the other independent variables are the same as H1	

Following the model selection, a robust regression is conducted for each hypothesis to refine the estimates further by taking to address potential biases introduced by outliers, ensuring that the results are precise and reliable.

In total, 20 regressions are performed to investigate the relationships between the variables. For each of the five dependent variables NAV, FFO, AFFO, NOI, and ROA four separate regressions are conducted. The first regression for each dependent variable includes the ESG score as an independent variable, while the subsequent three regressions replace the ESG score with the E score, S score, and G score, respectively, enabling a detailed examination of the distinct contributions of environmental, social, and governance factors to the outcomes of interest.

The additional independent variables included in the regressions, that are listed above, are incorporated to account for a wide range of financial and operational factors that influence the performance of REITs and scale the effect that the only ESG score might have on the performance variables accounted.

Finally, three more models are created based on each of the original models to examine the delayed effects of the ESG score and its component parts on the dependent variables over different time horizons in order to evaluate the possibility that changes in ESG practices may take time to show up in financial and operational outcomes. To determine whether the ESG score, the E, S, and G scores have a discernible temporal impact on performance indicators, the scores are specifically lagged by 1, 2, and 3 years.

Hypothesis n.5 model (H5):

$$PI_{i,t} = \beta_0 + \beta_1 TU_{it} + \beta_2 CR_{it} + \beta_3 DE_{it} + \beta_4 DY_{it} + \beta_5 FPR_{it} + \beta_6 MC_{it} + \beta_7 OR_{it} + \beta_8 lag1_{it} + \alpha_i + \varepsilon_{it}$$

Where:

lag1	*1 year lagged score (ESG, E, S, and G separately)*
the other independent variables are the same as H1	

Hypothesis n.6 model (H6):

$$PI_{i,t} = \beta_0 + \beta_1 TU_{it} + \beta_2 CR_{it} + \beta_3 DE_{it} + \beta_4 DY_{it} + \beta_5 FPR_{it} + \beta_6 MC_{it} + \beta_7 OR_{it} + \beta_8 lag2_{it} + \alpha_i + \varepsilon_{it}$$

Where:

lag2	*2 year lagged score (ESG, E, S, and G separately)*
the other independent variables are the same as H1	

Hypothesis n.7 model (H7):

$$PI_{i,t} = \beta_0 + \beta_1 TU_{it} + \beta_2 CR_{it} + \beta_3 DE_{it} + \beta_4 DY_{it} + \beta_5 FPR_{it} + \beta_6 MC_{it} + \beta_7 OR_{it} + \beta_8 lag3_{it} + \alpha_i + \varepsilon_{it}$$

Where:

lag3 3 year lagged score (ESG, E, S, and G separately)
the other independent variables are the same as H1

	NAV	FFO	AFFO	NOI	ROA	CapRate	DebtEquity	Dividend Yield	FFO Payout Ratio	AFFO Payout Ratio	Market Capitalization	ESGScore	EScore	SScore	GScore	OR
NAV	1.0000															
FFO	0.2130	1.0000														
AFFO	0.2209	0.9903	1.0000													
NOI	0.2588	0.8435	0.8517	1.0000												
ROA	0.1120	0.2399	0.2456	0.3665	1.0000											
CapRate	-0.0074	0.0129	0.0178	0.0111	0.0335	1.0000										
DebtEquity	-0.0129	-0.0068	-0.0071	-0.0088	-0.0139	0.0224	1.0000									
DividendYield	0.1310	0.0026	0.0104	0.0219	0.0945	0.0378	-0.0085	1.0000								
FFOPayoutRatio	0.1030	-0.0126	-0.0130	-0.0060	-0.0094	-0.0004	-0.0017	-0.0008	1.0000							
AFFOPayoutRatio	0.0670	0.0421	0.0473	0.0525	0.1231	-0.0154	-0.0056	0.0307	-0.0059	1.0000						
MarketCapitalization	0.0437	0.0318	0.0296	0.0192	-0.0765	0.0262	-0.0035	-0.0182	-0.0086	-0.0345	1.0000					
ESGScore	0.2334	0.2558	0.2664	0.2735	0.2492	0.0564	0.0028	0.2460	-0.0328	0.1248	0.1350	1.0000				
EScore	0.1325	0.2470	0.2560	0.2512	0.0498	0.0018	-0.0132	0.1278	-0.0220	0.0157	0.2800	0.7771	1.0000			
SScore	0.1608	0.2620	0.2743	0.2747	0.1101	0.0206	-0.0163	0.1781	-0.0242	0.0456	0.1466	0.8621	0.8519	1.0000		
GScore	0.2490	0.2004	0.2086	0.2215	0.3264	0.0795	0.0154	0.2648	-0.0331	0.1706	0.0375	0.9188	0.4808	0.6281	1.0000	
OR	0.2593	0.2604	0.2563	0.3229	0.3904	0.0008	-0.0197	0.1402	0.0663	0.2086	-0.0861	0.3582	0.1930	0.2514	0.3852	1.0000

Source: (Table created by the author)

(Table 1, Variables correlation)

RESULTS

The regressions here analysed, provide substantial insights into the relationship between sustainability measures and financial outcomes. The results suggest that, without considering time lagging, aggregated ESG scores exhibit statistically significant positive ($p<0.05$) effects on performance metrics which is visible accordingly with the outputs obtained through the regressions of all the considered dependant variables, such as NAV *(Table 2.1)*, NOI *(Table 2.0)*, FFO *(Table 2.2)*, AFFO (which always reflects aligned results with FFO, since it is the adjusted version of the same indicator, showing slightly higher effects) and ROA. This underscores the integrative benefit of considering environmental, social, and governance factors collectively, suggesting that comprehensive ESG practices foster improved operational efficiency and market perceptions of value *(Tables 2.0 to 2.2)*.

Disaggregating the effects reveals nuanced dynamics. The E score consistently demonstrates strong positive impacts, particularly on NOI, FFO and AFFO, with statistically significant coefficients ($p<0.01$) that reflect its critical role. Despite the homogeneity of significancy displayed by most of the variables analysed, once regressed, ROA, does not show a significant impact of the environmental aspect on the variable.

These results highlight how environmental measures, such resource conservation and energy efficiency, are becoming more and more important in luring investors who are concerned about sustainability and cutting costs. Prioritizing environmental policies has a noticeable positive impact on REIT performance, as evidenced by the E score's high explanatory power.

The significant impact of the social metric is visible throughout most of the variables analysed in the models, and the value of the effect is slightly less impactful compared to the one produced by the environmental dimension, indicating that social dimensions are indispensable for creating long-term stakeholder value.

The significance of employees' development, community involvement, and tenant satisfaction in promoting operational success is demonstrated by these findings.

In contrast, the G score presents mixed results. While it demonstrates positive and significant effects on specific performance indicators such as NAV and ROA, its overall contribution appears less consistent, since presenting negative and non-significant effects on the other indicators. This may suggest that the benefits of robust governance practices, including transparency and accountability, are contingent on contextual factors or that their effects are more indirect and long-term.

Among the models, H1 (ESG score) consistently exhibits the strongest and most homogeneous significance and explanatory power. While H2 (E score) and H3 (S score) show high significancy levels in most of the variables and important coefficients, they do not explain significant effects when evaluated on the ROA variable, providing useful insights into individual dimensions, without being fully explanatory such as the integrated ESG approach.

NOI	H1	H2	H3	H4
Lag (years)		0		
CapRate	0,0100	0,0125	0,0113	0,0082
DebtEquity	0,0027 **	0,0049 ***	0,0060 ***	0,0006
DividendYield	-0,0079	-0,0092	-0,0090	-0,0027
FFOPayoutRatio	-0,0018	-0,0029 **	-0,0019	-0,0034 **
MarketCapitalization	0,0877	0,0594	0,0663	0,0942 *
OR	0,1778 ***	0,1897 ***	0,1803 ***	0,2100 ***
ESGScore	0,1010 **			
EScore		0,1406 ***		
SScore			0,1390 ***	
GScore				0,0356
_cons	0,0000	-0,1498	-0,1542	-0,1577
R-squared (whitin)	7,31%	9,53%	9,59%	5,68%
R-squared (between)	14,35%	15,67%	16,63%	13,19%
R-squared (overall)	12,18%	13,68%	14,23%	11,05%
Model	fixed effects	random effects	random effects	random effects

Source: (Table created by the author) Legend: * p<.1; ** p<.05; *** p<.001

(Table 2.0, H1-H2-H3-H4 NOI correlations)

NAV	H1	H2	H3	H4
Lag (years)		0		
CapRate	0,0104	0,0121	0,0109	0,0088
DebtEquity	0,0188 ***	0,0198 ***	0,0200 ***	0,0168 ***
DividendYield	-0,0160	-0,0122	-0,0109	-0,0148
FFOPayoutRatio	0,0698 ***	0,0691 ***	0,0696 ***	0,0696 ***
MarketCapitalization	0,0815 *	0,0740 *	0,0814 *	0,0938 **
OR	0,2472 ***	0,2602 ***	0,2574 ***	0,2533 ***
ESGScore	0,1168 **			
EScore		0,1018 **		
SScore			0,0857 **	
GScore				0,1060 **
_cons	0,0000	0,0000	0,0000	0,0000
R-squared (whitin)	9,32%	9,19%	8,80%	8,83%
R-squared (between)	9,37%	7,34%	8,13%	9,98%
R-squared (overall)	9,33%	7,93%	8,34%	9,56%
Model	fixed effects	fixed effects	fixed effects	fixed effects

Source: (Table created by the author) Legend: * p<.1; ** p<.05; *** p<.001

(Table 2.1, H1-H2-H3-H4 NAV correlations)

FFO	H1	H2	H3	H4
Lag (years)		0		
CapRate	0,0019	0,0053	0,0040	0,0010
DebtEquity	-0,0199 ***	-0,0168 ***	-0,0159 ***	-0,0214 ***
DividendYield	-0,0167	-0,0194 *	-0,0184	-0,0082
FFOPayoutRatio	-0,0045 **	-0,0046 **	-0,0037 **	-0,0055 ***
MarketCapitalization	0,1153 *	0,0907	0,0980	0,1287 *
OR	0,1276 **	0,1199 **	0,1120 **	0,1545 ***
ESGScore	0,0769 **			
EScore		0,1424 ***		
SScore			0,1338 ***	
GScore				-0,0146
_cons	0,0000	0,0000	0,0000	0,0000
R-squared (whitin)	3,48%	5,72%	5,50%	2,80%
R-squared (between)	10,32%	11,02%	12,15%	6,05%
R-squared (overall)	7,67%	8,88%	9,31%	4,85%
Model	fixed effects	fixed effects	fixed effects	fixed effects

Source: (Table created by the author) Legend: * p<.1; ** p<.05; *** p<.001

(Table 2.2, H1-H2-H3-H4 FFO correlations)

While studying the effects of the time-lagged variables, the results present a similar pattern throughout all the dependant variables, which is coherent with the analysis at a time 0. The results obtained from the regressions on ROA always present conflicting outputs, compared to the other variables, both as lagging time as time 0. Particularly, while regressing H2 and H3, the effect produced on ROA is not significant and sometimes negative, while on the other variables it is strongly significant and positive. When regressing H4, the opposite outcome emerges, displaying trends that are dissimilar from the others. ESG score seems the only not presenting this atypic behaviour resulting always coherent through the variables.

The analysis indicates important temporal dynamics that further clarify the connection between sustainability indicators and financial results when considering the time-lagged effects of ESG metrics on REIT performance. The total ESG score continues to have a positive and statistically significant impact on all the indicators with a 1-year lag; it increases further with a 2-year lag and somewhat decreases with a 3-year model (*Tables 3.0 to 3.3*, *Chart 8.0 to 8.4*). As demonstrated by the slight increase in effect magnitude when compared to the contemporaneous trial, ESG approaches have a lasting influence even if they offer immediate benefits.

When analysing the lagged effects of the individual ESG components, the environmental score and social score consistently demonstrate the strongest and most enduring impact across all lag periods. With a 1-year lag, they remain highly significant for NOI *(Table 3.0*, *Chart 8.0)*, FFO *(Table 3.2*, *Chart 8.2)*, and AFFO ($p < 0.01$) with high coefficients that changes with the same pattern as the ESG score. The significance and coefficient values slightly decrease with 3-year lag, yet both the E score and S score continues to positively influence all the indicators, except for ROA *(Table 3.3*, *Chart 8.4)*.

The G Score, on the other hand, exhibits a more complex and context-dependent temporal effect. The benefits of governance practices, such as increased transparency and board independence, may manifest primarily in operational stability rather than direct financial returns, and their influence may take time to generate a real effect. This is indicated by the high coefficients, which show significant positive impacts across all the variables when lag for 1, 2, and 3 years, even though they do not present significant effects in year 0.

All things considered, the time-lagged study highlights how significant the ESG score is as a whole, especially in the near future. Although sustainable policies create value in the short and medium term, their long-term effects necessitate persistent and sustained strategy alignment, as seen by the declining relevance of all ESG measures over longer lag periods.

(Table 3.0, NOI time lag comparisons)

NOI	H1	H1.5	H1.6	H1.7	H2	H2.5	H2.6	H2.7	H3	H3.5	H3.6	H3.7	H4	H4.5	H4.6	H4.7
Lag (years)	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
CapRate	0.0100	0.0133	0.0153	0.0134	0.0125	0.0145	0.0125	0.0097	0.0113	0.0136	0.0143	0.0116	0.0082	0.0096	0.0117	0.0108
DebtEquity	0.0027 **	0.0033 ***	0.1490	0.1060	0.0049 ***	0.0052 ***	0.0861	0.0822	0.0060 ***	0.0055 ***	0.1142	0.0912	0.0006	0.0007	0.1617	0.1209
DividendYield	-0.0079	-0.0155	-0.0064	-0.0020	-0.0092	-0.0098	0.0049	0.0069	-0.0090	-0.0127	0.0013	0.0056	-0.0027	-0.0102	-0.0128	-0.0117
FFOPayoutRatio	-0.0018	0.0005	0.0028	0.0039 *	-0.0029 **	-0.0027 **	-0.0024	-0.0020	-0.0019	-0.0007	0.0005	0.0014	-0.0034 **	-0.0014	0.0016	0.0028
MarketCapitalization	0.0877	0.0786	0.0534	0.0744	0.0594	0.0463	0.0301	0.0527	0.0663	0.0557	0.0453	0.0625	.09420854* *	0.0993	0.0919	0.1009
OR	0.1778 ***	0.1632 **	0.1396 **	0.1305 **	0.1897 ***	0.1856 ***	0.1731 ***	0.1607 ***	0.1803 ***	0.1762 ***	0.1629 **	0.1529 **	0.2100 ***	0.1932 ***	0.1659 **	0.1533 **
ESGScore	0.1010 **															
EScore					0.1406 ***											
SScore									0.1390 ***							
GScore													0.0356			
lag_esg1		0.1672 ***														
lag_e1						0.1687 ***										
lag_s1										0.1787 ***						
lag_g1														0.1038 **		
lag_esg2			0.2553 ***													
lag_e2							0.1954 ***									
lag_s2											0.2232 ***					
lag_g2															0.2023 ***	
lag_esg3				0.2445 ***												
lag_e3								0.1806 ***								
lag_s3												0.2164 ***				
lag_g3																0.2006 ***
_cons	0.0000	0.0116 ***	0.0270 ***	0.0550 ***	-0.1498	-0.1415	-0.1266	-0.1089	-0.1542	-0.1461	-0.1291	-0.1054	-0.1577	-0.1521	-0.1381	-0.1259
R-squared (whitin)	7.31%	9.96%	14.20%	12.53%	9.53%	11.25%	12.67%	10.31%	9.59%	12.15%	15.16%	13.05%	5.68%	6.90%	9.70%	8.90%
R-squared (between)	14.35%	14.74%	15.15%	13.65%	15.67%	15.40%	15.11%	13.38%	16.63%	16.75%	16.53%	14.92%	13.19%	13.45%	13.76%	12.88%
R-squared (overall)	12.18%	13.38%	14.81%	13.31%	13.68%	14.06%	14.22%	12.48%	14.23%	15.15%	15.78%	14.15%	11.05%	11.81%	12.90%	12.12%
Model	fixed effects	fixed effects	fixed effects	fixed effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects

Source: (Table created by the author) Legend: * p<.1; ** p<.05; *** p<.001

(Table 3.1, NAV time lag comparisons)

NAV	H1	H1.5	H1.6	H1.7	H2	H2.5	H2.6	H2.7	H3	H3.5	H3.6	H3.7	H4	H4.5	H4.6	H4.7
Lag (years)	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
CapRate	0.0104	0.0126	0.0132	0.0120	0.0121	0.0133	0.0120	0.0104	0.0109	0.0121	0.0122	0.0108	0.0088	0.0107	0.0120	0.0115
DebtEquity	0.0188 ***	0.0199 ***	-0.0138	0.0327	0.0198 ***	0.0211 ***	-0.0473	0.0216	0.0200 ***	0.0206 ***	-0.0336	0.0267	0.0168 ***	0.0182 ***	-0.0026	0.0414
DividendYield	-0.0160	-0.0180	-0.0059	0.0005	-0.0122	-0.0115	0.0006	0.0049	-0.0109	-0.0115	-0.0012	0.0038	-0.0148	-0.0161	-0.0089	-0.0037
FFOPayoutRatio	0.0698 ***	0.0692 ***	0.0669 ***	0.0636 ***	0.0691 ***	0.0672 ***	0.0646 ***	0.0613 ***	0.0696 ***	0.0681 ***	0.0656 ***	0.0624 ***	0.0696 ***	0.0691 ***	0.0669 ***	0.0639 ***
MarketCapitalization	0.0815 *	0.0516	0.0592	0.0833	0.0740 *	0.0425	0.0533	0.0840	0.0814 *	0.0552	0.0700	0.0934 *	0.0938 **	0.0725 *	0.0843 *	0.1020 *
OR	0.2472 ***	0.2456 ***	0.2509 ***	0.2625 ***	0.2602 ***	0.2573 ***	0.2618 ***	0.2699 ***	0.2574 ***	0.2563 ***	0.2615 ***	0.2691 ***	0.2533 ***	0.2534 ***	0.2569 ***	0.2654 ***
ESGScore	0.1168 **															
EScore					0.1018 **											
SScore									0.0857 **							
GScore													0.1060 **			
lag_esg1		0.1288 **														
lag_e1						0.1114 **										
lag_s1										0.0957 **						
lag_g1														0.1082 *		
lag_esg2			0.1324 **													
lag_e2							0.1009 **									
lag_s2											0.0907 **					
lag_g2															0.1164 **	
lag_esg3				0.1146 **												
lag_e3								0.0786 **								
lag_s3												0.0776 **				
lag_g3																0.1066 **
_cons	0.0000	0.0069 ***	0.0120 **	0.0239 ***	0.0000	0.0085 ***	0.0151 ***	0.0261 ***	0.0000	0.0083 ***	0.0149 ***	0.0260 ***	0.0000	0.0059 **	0.0097 **	0.0187 **
R-squared (whitin)	9.32%	8.85%	8.32%	7.91%	9.19%	8.83%	8.09%	7.52%	8.80%	8.43%	7.86%	7.51%	8.83%	8.13%	7.75%	7.63%
R-squared (between)	9.37%	9.46%	9.96%	9.44%	7.34%	7.34%	7.78%	7.58%	8.13%	8.15%	8.47%	8.12%	9.98%	9.98%	10.39%	9.81%
R-squared (overall)	9.33%	9.24%	9.42%	8.94%	7.93%	7.79%	7.85%	7.52%	8.34%	8.22%	8.26%	7.91%	9.56%	9.36%	9.54%	9.12%
Model	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects

Source: (Table created by the author) Legend: * p<.1; ** p<.05; *** p<.001

(Table 3.2, FFO time lag comparisons)

FFO	H1	H1.5	H1.6	H1.7	H2	H2.5	H2.6	H2.7	H3	H3.5	H3.6	H3.7	H4	H4.5	H4.6	H4.7
Lag (years)	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
CapRate	0.0019	0.0048	0.0075	0.0058	0.0053	0.0073	0.0061	0.0035	0.0040	0.0064	0.0079	0.0054	0.0010	0.0018	0.0041	0.0032
DebtEquity	-0.0199 ***	-0.0209 ***	0.1051	0.0527	-0.0168 ***	-0.0184 ***	0.0447	0.0280	-0.0159 ***	-0.0183 ***	0.0742	0.0371	-0.0214 ***	-0.0229 ***	0.1063	0.0636
DividendYield	-0.0167	-0.0237 **	-0.0234 *	-0.0210	-0.0194 *	-0.0201 *	-0.0115	-0.0111	-0.0184	-0.0222 *	-0.0148	-0.0119	-0.0082	-0.0142	-0.0252 *	-0.0266 *
FFOPayoutRatio	-0.0045 **	-0.0033 **	-0.0013	-0.0010	-0.0046 **	-0.0051 ***	-0.0051 **	-0.0052 ***	-0.0037 **	-0.0033 **	-0.0023	-0.0019	-0.0055 ***	-0.0051 **	-0.0029	-0.0023
MarketCapitalization	0.1153 *	0.1185	0.1012	0.1287	0.0907	0.0903	0.0775	0.1150	0.0980	0.0993	0.0939	0.1221	0.1287 *	0.1502 *	0.1560	0.1747
OR	0.1276 **	0.1104 **	0.0914 **	0.0837 **	0.1199 **	0.1137 **	0.1060 **	0.0939 **	0.1120 **	0.1059 **	0.0973 **	0.0870 **	0.1545 ***	0.1344 **	0.1132 **	0.0968 **
ESGScore	0.0769 **															
EScore					0.1424 ***											
SScore									0.1338 ***							
GScore													-0.0146			
lag_esg1		0.1343 **														
lag_e1						0.1617 ***										
lag_s1										0.1663 ***						
lag_g1														0.0455		
lag_esg2			0.2303 ***													
lag_e2							0.2012 ***									
lag_s2											0.2233 ***					
lag_g2															0.1429 **	
lag_esg3				0.2134 ***												
lag_e3								0.1772 ***								
lag_s3												0.2132 ***				
lag_g3																0.1402 **
_cons	0.0000	0.0135 ***	0.0274 ***	0.0553 ***	0.0000	0.0156 ***	0.0334 ***	0.0621 ***	0.0000	0.0156 ***	0.0339 ***	0.0654 ***	0.0000	0.0132 ***	0.0248 ***	0.0457 ***
R-squared (whitin)	3.48%	4.65%	7.17%	6.00%	5.72%	6.34%	7.70%	5.87%	5.50%	6.68%	9.00%	7.52%	2.80%	2.99%	4.08%	3.69%
R-squared (between)	10.32%	10.92%	13.24%	10.80%	11.02%	10.16%	10.36%	7.12%	12.15%	11.78%	12.28%	9.39%	6.05%	6.60%	9.09%	7.26%
R-squared (overall)	7.67%	8.70%	11.28%	9.40%	8.88%	8.74%	9.42%	6.76%	9.31%	9.76%	11.05%	8.79%	4.85%	5.39%	7.54%	6.26%
Model	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects

Source: (Table created by the author) Legend: * p<.1; ** p<.05; *** p<.001

(Table 3.3, ROA time lag comparisons)

ROA	H1	H1.5	H1.6	H1.7	H2	H2.5	H2.6	H2.7	H3	H3.5	H3.6	H3.7	H4	H4.5	H4.6	H4.7
Lag (years)	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
CapRate	0.0337	0.0264	0.0211	0.0178	0.0332	0.0252	0.0203	0.0173	0.0335	0.0259	0.0208	0.0176	0.0328	0.0264	0.0216	0.0183
DebtEquity	0.0022 **	0.0014	0.2477	0.2712	0.0013	0.0007	0.2465	0.2738	0.0019	0.0013	0.2453	0.2715	0.0013	0.0011	0.2565	0.2731
DividendYield	-0.0036	0.0035	0.0081	0.0011	0.0011	0.0073	0.0081	0.0000	0.0002	0.0059	0.0085	0.0009	-0.0064	0.0006	0.0063	0.0004
FFOPayoutRatio	-0.0173 ***	-0.0157 ***	-0.0140 ***	-0.0121 ***	-0.0179 ***	-0.0164 ***	-0.0144 ***	-0.0123 ***	-0.0176 ***	-0.0162 ***	-0.0143 ***	-0.0123 ***	-0.0171 ***	-0.0151 ***	-0.0134 ***	-0.0116 ***
MarketCapitalization	-0.0051	-0.0101	-0.0076	-0.0035	0.0024	0.0018	0.0053	0.0069	-0.0004	-0.0055	-0.0034	-0.0008	-0.0016	-0.0095	-0.0095	-0.0068
OR	0.1513 **	0.2044 ***	0.2011 ***	0.2010 ***	0.1666 **	0.2137 ***	0.2066 ***	0.2037 ***	0.1622 **	0.2095 ***	0.2036 ***	0.2021 ***	0.1442 *	0.1993 ***	0.1971 ***	0.1986 ***
ESGScore	0.0555 **															
EScore					0.0059											
SScore									0.0196							
GScore													0.0870 ***			
lag_esg1		0.0300														
lag_e1						-0.0080										
lag_s1										0.0113						
lag_g1														0.0546 **		
lag_esg2			0.0139													
lag_e2							-0.0151									
lag_s2											0.0020					
lag_g2															0.0369	
lag_esg3				0.0018												
lag_e3								-0.0203								
lag_s3												-0.0057				
lag_g3																0.0205
_cons	0.0000	-0.0043 ***	0.0082 **	0.0168 **	0.0000	-0.0043 ***	0.0079 *	0.0149 **	0.0000	-0.0041 ***	0.0083 **	0.0162 **	0.0000	-0.0049 ***	0.0073 *	0.0167 **
R-squared (whitin)	2.15%	6.08%	5.52%	5.21%	1.86%	5.93%	5.54%	5.30%	1.90%	5.94%	5.49%	5.22%	2.46%	6.37%	5.67%	5.27%
R-squared (between)	32.45%	31.46%	28.84%	25.72%	29.71%	30.00%	28.16%	25.77%	29.79%	29.91%	28.05%	25.60%	36.11%	34.18%	31.13%	27.48%
R-squared (overall)	16.60%	23.07%	21.68%	19.95%	15.15%	21.99%	21.13%	19.93%	15.17%	21.95%	21.08%	19.84%	18.66%	25.06%	23.41%	21.30%
Model	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects

Source: (Table created by the author) Legend: * p<.1; ** p<.05; *** p<.001

DISCUSSION

The results indicate a positive and statistically significant relationship between all REIT performance metrics and the overall ESG score, with the influence reducing with a 3-year lag and increasing marginally with a 2-year lag. This pattern suggests that even if ESG practices have a less influence over longer time horizons, they still have short- and medium-term advantages. These findings are consistent with those of Morri et al. (2023), who found that ESG scores were significant at both t−1 and t−3. The results' progressive decline in the coefficient's value is consistent with studies emphasizing the importance of ongoing ESG commitment for long-term benefits (Friede et al., 2015). On the other hand, they deviate from "ESG Dynamics in Real Estate" (Morri et al., 2024), which claims that REIT returns and ESG scores had a negative association during the examined period but a positive relationship when the HESGL (high ESG scores minus low ESG scores) factor is taken into account. The inclusion of extra market parameters in different models or variations in methodological techniques could be the cause of this discrepancy.

The benefits of ESG integration are most apparent in the near term, most likely due to quick improvements in operations and reputation, while their long-term effects depend on continued commitment and market conditions, according to this temporal pattern.

According to the study, the most important and consistent subcomponent across all lag times is social and environmental factors. The 3-year lag lessens the significance of these factors, but they nevertheless have a beneficial impact on important financial indicators including NOI, NAV, FFO, and AFFO.

Studies by Brounen and Marcato (2018) and Eichholtz et al. (2012) support the long-term impact of the E score by emphasizing the significance of environmental factors like as energy efficiency and green certifications in improving operational and financial outcomes over time. For instance, Brounen and Marcato (2018) point to upfront investment costs and a learning curve in implementing environmental measures as the causes of the first negative returns associated with high E scores. Additionally consistent with the social aspects is the literature, such as that of Fuerst and McAllister (2011) and Brounen and Marcato (2018), which highlight the importance of social components, particularly in fostering stakeholder participation and tenant satisfaction. Nonetheless, research such as Yngwie Romijn (2021) and Rivas (2011) present conflicting or ambiguous findings concerning the S score, indicating that its influence can be contingent upon the coherence of social programs and the wider economic environment. When lagged by 1, 2, and 3 years, the data finally shows a clear trajectory for the G score, with small impacts at t-0 but significant and positive advantages across most metrics.

Studies such as Brounen and Marcato (2018) and Morri et al. (2023) have shown that the benefits of good governance, such as board independence and transparency, can take time to materialize. Nonetheless, they diverge from studies that indicated the G score had negligible or no immediate advantages (Yngwie Romijn, 2021, for instance), highlighting the need of longer-term lags in identifying governance effects.

While the consistent performance of the social score may reflect the focus on community-oriented strategies and tenant engagement within the examined REIT sample, the results, which show strong medium-term gains, also show that environmental efforts eventually yield

financial benefits as investments mature and operational efficiencies are realized. Additionally, the significance of the governance score highlights its function in fostering investor trust and operational stability, especially in regulated sectors like real estate. Last but not least, these variations across ESG dimensions may be the consequence of different sample characteristics, methodological approaches, or particular market contexts. This highlights the strategic significance of ESG integration and advances our knowledge of its temporal effects on REIT performance.

A COVID-19 Period Disclosure

A further analysis is performed to determine whether the economic downturn of 2020, caused by the COVID-19 pandemic, influences either positively, negatively or does not impact on the results obtained from the previous analysis. Since the considered dataset spans 15 years, from 2010 to 2024, the effects displayed in the results of this research may be contaminated by the economic policies implemented during the years 2020 and 2021 to contrast the global emergency.

A preliminary analysis is conducted on the variation of the average value of occupancy rate through the encompassed years, highlighting that both 2020 and 2021 results in having a drop of occupancy compared to the other years, which, contrary, does not differ significantly from the total average of the dataset (*Table 4*).

Consequently, to these results, an analogue analysis is implemented on all the performance indicators, concurrently with the ESG score. The results shows that the average values of each variable do not differ significantly from the one resulting without considering 2020 and 2021.

A more visible deviation is findable analysing respectively ESG, E, and S scores, where the average score, obtained without considering the COVID's years, tends to be lower by a range that goes form 3.1% to 6.8%, compared to the total average of the dataset (*Table 4*).

YEARS	OR	NAV	NOI	FFO	AFFO	ROA	ESG	E	S	G
2010	92,1%	22,63	359,92	243,90	251,94	0,10	28,78	9,61	8,34	78,61
2011	91,2%	21,45	344,03	259,11	261,08	0,07	29,60	12,72	9,77	78,07
2012	92,1%	22,83	402,69	286,63	286,01	0,07	30,47	14,28	9,78	79,03
2013	92,2%	20,76	427,28	338,08	344,03	0,07	31,48	17,89	11,59	79,40
2014	92,8%	20,76	486,89	380,09	381,68	0,07	32,35	19,82	12,87	79,94
2015	93,4%	20,69	525,79	396,95	412,07	0,08	34,87	19,94	13,20	82,53
2016	93,1%	21,52	566,66	442,82	441,38	0,08	36,08	21,21	14,45	82,94
2017	92,8%	26,39	611,81	481,41	475,58	0,08	38,80	22,79	16,53	84,20
2018	92,9%	25,91	648,91	503,82	508,10	0,08	41,05	24,49	19,46	84,53
2019	93,1%	26,16	665,33	531,08	545,33	0,08	43,37	26,85	22,26	84,44
2020	88,6%	22,71	627,58	461,61	502,14	0,07	45,45	28,95	24,41	85,23
2021	88,8%	23,96	633,16	577,04	588,87	0,06	46,77	31,29	26,19	85,16
2022	91,3%	24,00	738,25	601,49	616,34	0,07	48,40	33,86	27,64	85,76
2023	91,6%	23,86	800,10	625,15	642,59	0,07	44,92	28,44	24,45	84,80
2024	91,7%	23,23	895,97	700,20	717,15	0,08	43,59	25,77	22,69	84,87
Average	91,8%	23,13	582,29	455,29	464,95	0,07	38,40	22,53	17,58	82,64
Average (- '20 & '21)	92,3%	23,09	574,89	445,44	452,56	0,08	37,21	21,36	16,39	82,24
Δ	-0,5 ppt	0,03	7,40	9,85	12,39	0,00	1,19	1,17	1,19	0,39
Δ%	-0,5%	0,1%	1,3%	2,2%	2,7%	-2,0%	3,1%	5,2%	6,8%	0,5%

Source: (Table created by the author)

(Table 4, Variables average variation)

YEARS	OR	NAV	NOI	FFO	AFFO	ROA	ESG	E	S	G
2010										
2011	-1,0%	-5,2%	-4,4%	6,2%	3,6%	-29,0%	2,9%	32,4%	17,1%	-0,7%
2012	1,0%	6,4%	17,1%	10,6%	9,5%	4,7%	2,9%	12,3%	0,1%	1,2%
2013	0,1%	-9,1%	6,1%	18,0%	20,3%	-4,5%	3,3%	25,2%	18,5%	0,5%
2014	0,6%	0,0%	13,9%	12,4%	10,9%	6,5%	2,8%	10,8%	11,0%	0,7%
2015	0,6%	-0,4%	8,0%	4,4%	8,0%	3,7%	7,8%	0,6%	2,6%	3,2%
2016	-0,3%	4,0%	7,8%	11,6%	7,1%	4,6%	3,5%	6,4%	9,4%	0,5%
2017	-0,3%	22,6%	8,0%	8,7%	7,7%	-3,3%	7,5%	7,4%	14,4%	1,5%
2018	0,1%	-1,8%	6,1%	4,7%	6,8%	3,7%	5,8%	7,5%	17,7%	0,4%
2019	0,3%	1,0%	2,5%	5,4%	7,3%	-2,8%	5,7%	9,6%	14,4%	-0,1%
2020	-4,9%	-13,2%	-5,7%	-13,1%	-7,9%	-12,8%	4,8%	7,8%	9,7%	0,9%
2021	0,2%	5,5%	0,9%	25,0%	17,3%	-6,7%	2,9%	8,1%	7,3%	-0,1%
2022	2,8%	0,2%	16,6%	4,2%	4,7%	10,8%	3,5%	8,2%	5,6%	0,7%
2023	0,3%	-0,6%	8,4%	3,9%	4,3%	2,4%	-7,2%	-16,0%	-11,6%	-1,1%
2024	0,2%	-2,7%	12,0%	12,0%	11,6%	14,0%	-3,0%	-9,4%	-7,2%	0,1%
Average growth	0,0%	0,5%	6,9%	8,2%	7,9%	-0,6%	3,1%	7,9%	7,8%	0,6%
Average growth (- '20 & '21)	0,4%	1,2%	8,5%	8,5%	8,5%	0,9%	3,0%	7,9%	7,7%	0,6%
Δ%	-0,4%	-0,7%	-1,6%	-0,4%	-0,5%	-1,5%	0,1%	0,0%	0,1%	0,0%

Source: (Table created by the author)

(Table 5, Variables growth)

The following studies' findings, which do not include the 2020 and 2021 recession years, largely support the patterns found in the earlier research. The significance levels and coefficient magnitudes, particularly, show some significant variations among the different models. When the COVID-19 years are taken out of the equation, ESG's capacity to explain asset profitability appears to increase, but its relationship with performance metrics relating to cash flow seems to decline (*Table 6.3*). In H1 (*Table 6.2*), the significance of FFO vanishes, but ROA shows a greater degree of importance. Additionally, after accounting for the economic disruptions of 2020 and 2021, the coefficients for NAV, NOI, FFO, and ROA are all lower than in the previous analysis, indicating that the overall effect of ESG on performance indicators is somewhat less significant.

The previous pattern of greater influence on profitability measures is confirmed in H2, where the exclusion of COVID-19 years results in a higher ROA significance but a lower significance level for FFO in H2.7. NAV shows lower values (*Table 6.1*), and NOI shows higher coefficients in H2 and H2.5 but decreasing in H2.6 and H2.7, suggesting that environmental factors may have had a greater short-term impact on operating income before moderating in later models. The model's higher ROA coefficients support the notion that environmental factors increase asset profitability, which is in line with past studies in the field that emphasize the long-term financial benefits of sustainable investments.

The pattern observed in H1 and H2 is mirrored in H3, where ROA exhibits a larger significance level in H3 and H3.5. While NOI and FFO show varied results, NAV coefficients are lower. These results imply that while social influences may have helped boost financial performance in the near term, especially during certain times, their impacts are not consistent throughout all time horizons. The idea that socially conscious tactics boost asset profitability, possibly as a result of higher community involvement and better tenant satisfaction, is supported by the rise in ROA coefficients.

In H4, the governance score shows an increased significance level for ROA in H4.6 and H4.7, indicating that governance practices gain greater explanatory power for asset profitability when the COVID-19 period is excluded. However, similar to H1, H2, and H3, the coefficients for NAV, NOI, and FFO are lower than in the previous analysis, while ROA presents higher coefficients, confirming that governance factors have a more pronounced influence on asset returns than on other financial indicators (*Tables 6.0 to 6.3*).

(Table 6.0, NOI 2 years gap analysis)

NOI (2 y gap)	H1	H1.5	H1.6	H1.7	H2	H2.5	H2.6	H2.7	H3	H3.5	H3.6	H3.7	H4	H4.5	H4.6	H4.7
Lag (years)	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
CapRate	0.0099	0.0125	0.0369 **	0.1735 **	0.0124	0.0139	0.0280	0.1606 **	0.0112	0.0128	0.0327	0.1708 **	0.0082	0.0090	0.0295 *	0.1328 **
DebtEquity	0.0021 **	0.0021 **	0.2685 *	-0.0023	0.0042 ***	0.0034 ***	0.1876	-0.0196	0.0050 ***	0.0031 ***	0.2193	-0.0245	0.0004	0.0004	0.2548	0.0139
DividendYield	-0.0047	-0.0131	-0.0156	0.0077	-0.0069	-0.0096	-0.0013	0.0203	-0.0064	-0.0126	-0.0011	0.0126	0.0002	-0.0077	-0.0312 *	0.0031
FFOPayoutRatio	-0.0022	-0.0015	0.0015	0.0000	-0.0040 **	-0.0037 ***	-0.0026 ***	-0.0049 ***	-0.0027 **	-0.0021 **	0.0004	-0.0012	-0.0044 **	-0.0034 **	0.0002	-0.0013
MarketCapitaliza	0.0935	0.0877	0.0383	0.0654	0.0626	0.0491	0.0206	0.0527	0.0702	0.0560	0.0265	0.0534	0.0941	0.0971	0.0660	0.0741
OR	0.1864 **	0.1866 **	0.1822 **	0.1355 **	0.1970 ***	0.2087 ***	0.2243 ***	0.1762 **	0.1879 ***	0.2002 ***	0.2097 ***	0.1649 **	0.2253 ***	0.2251 ***	0.2103 ***	0.1615 **
ESGScore	0.0925 **															
EScore					0.1499 ***											
SScore									0.1436 ***							
GScore													0.0195			
lag_esg1		0.1489 ***														
lag_e1						0.1733 ***										
lag_s1										0.1793 ***						
lag_g1														0.0756 *		
lag_esg2			0.2517 ***													
lag_e2							0.1876 ***									
lag_s2											0.2332 ***					
lag_g2															0.1884 ***	
lag_esg3				0.2203 ***												
lag_e3								0.1330 ***								
lag_s3												0.2047 ***				
lag_g3																0.1781 ***
_cons	-0.0012	0.0060	0.0231 **	0.0319 **	-0.1353	-0.1283	-0.1171	-0.1361	-0.1384	-0.1286	-0.1018	-0.1028	-0.1531	-0.1543	-0.1431	-0.1578
R-squared (whiti	6.86%	9.05%	14.48%	14.66%	9.42%	10.88%	12.63%	10.45%	9.23%	11.33%	15.60%	14.72%	5.55%	6.65%	10.66%	12.14%
R-squared (betw	14.26%	14.70%	16.43%	13.59%	15.78%	15.80%	16.33%	13.60%	16.48%	16.68%	17.39%	15.24%	13.49%	14.11%	15.80%	14.30%
R-squared (overa	11.90%	13.10%	15.99%	13.69%	13.62%	14.25%	15.34%	12.95%	13.93%	14.93%	16.81%	14.94%	11.08%	12.10%	14.69%	13.98%
Model	fixed effects	fixed effects	fixed effects	fixed effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects

Source: (Table created by the author) Legend: * p<.1; ** p<.05; *** p<.001

(Table 6.1, NAV 2 years gap analysis)

NAV (2 y gap)	H1	H1.5	H1.6	H1.7	H2	H2.5	H2.6	H2.7	H3	H3.5	H3.6	H3.7	H4	H4.5	H4.6	H4.7
Lag (years)	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
CapRate	0.0106	0.0112	0.0293	0.2790	0.0120	0.0118	0.0263	0.2812	0.0110	0.0107	0.0269	0.2854	0.0092	0.0097	0.0269	0.2694
DebtEquity	0.0157 ***	0.0148 ***	-0.1744	-0.0566	0.0166 ***	0.0156 ***	-0.2115	-0.0653	0.0167 ***	0.0152 ***	-0.2018	-0.0668	0.0142 ***	0.0139 ***	-0.1782	-0.0491
DividendYield	-0.0100	-0.0088	0.0254	-0.0049	-0.0066	-0.0035	0.0329	0.0017	-0.0054	-0.0036	0.0314	-0.0015	-0.0090	-0.0066	0.0200	-0.0057
FFOPayoutRatio	0.0575 ***	0.0510 ***	0.0410 ***	0.0609 ***	0.0562 ***	0.0500 ***	0.0397 ***	0.0590 ***	0.0568 ***	0.0507 ***	0.0407 ***	0.0607 ***	0.0575 ***	0.0508 ***	0.0407 ***	0.0606 ***
MarketCapitaliza	0.0898 *	0.0599	0.0738	0.1204	0.0829 *	0.0527	0.0702	0.1268	0.0888 *	0.0609	0.0803	0.1275	0.0991 *	0.0761 *	0.0937 *	0.1375
OR	0.2491 ***	0.2439 ***	0.2402 **	0.2705 **	0.2608 ***	0.2535 ***	0.2500 **	0.2790 **	0.2582 ***	0.2538 ***	0.2493 **	0.2752 **	0.2566 ***	0.2539 ***	0.2482 **	0.2755 **
ESGScore	0.1065 **															
EScore					0.0976 **											
SScore									0.0816 **							
GScore													0.0910 *			
lag_esg1		0.1090 **														
lag_e1						0.1020 **										
lag_s1										0.0861 **						
lag_g1														0.0825 *		
lag_esg2			0.1054 **													
lag_e2							0.0864 **									
lag_s2											0.0812 **					
lag_g2															0.0792 **	
lag_esg3				0.1026 **												
lag_e3								0.0639 *								
lag_s3												0.0915 **				
lag_g3																0.0799 **
_cons	-0.0007	0.0027	0.0040	0.0218 **	-0.0002	0.0051	0.0056	0.0178 *	-0.0007	0.0045	0.0073	0.0286 **	-0.0043	-0.0044	-0.0065	0.0086 *
R-squared (whiti	8.25%	6.99%	5.77%	8.31%	8.21%	7.10%	5.74%	8.01%	7.88%	6.78%	5.63%	8.30%	7.82%	6.48%	5.40%	8.10%
R-squared (betw	8.53%	8.48%	8.69%	5.40%	6.60%	6.56%	6.82%	4.06%	7.38%	7.30%	7.44%	4.44%	9.05%	8.85%	8.85%	5.65%
R-squared (overa	8.40%	7.97%	7.79%	5.94%	7.10%	6.70%	6.47%	4.84%	7.53%	7.11%	6.87%	5.21%	8.58%	8.05%	7.79%	6.08%
Model	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects

Source: (Table created by the author) Legend: * p<.1; ** p<.05; *** p<.001

FFO (2y gap)	H1	H1.5	H1.6	H1.7	H2	H2.5	H2.6	H2.7	H3	H3.5	H3.6	H3.7	H4	H4.5	H4.6	H4.7
Lag (years)	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
CapRate	0.0041	0.0066	0.0267 **	0.0503	0.0076	0.0094	0.0210	0.0596	0.0063	0.0083	0.0253 *	0.0695	0.0033	0.0038	0.0189 *	0.0325
DebtEquity	-0.0196 ***	-0.0201 ***	0.1389	-0.0086	-0.0166 ***	-0.0181 ***	0.0604	-0.0280	-0.0160 ***	-0.0184 ***	0.0949	-0.0315	-0.0206 ***	-0.0210 ***	0.1083	0.0021
DividendYield	-0.0053	-0.0119	-0.0230 **	-0.0004	-0.0088	-0.0109	-0.0053	0.0119	-0.0077	-0.0129	-0.0049	0.0045	0.0035	-0.0013	-0.0324 **	0.0007
FFOPayoutRatio	-0.0039 **	-0.0037 **	-0.0009	-0.0024	-0.0042 **	-0.0044 ***	-0.0037 **	-0.0056 ***	-0.0030 **	-0.0030 **	-0.0007	-0.0018	-0.0057 **	-0.0051 ***	-0.0021 *	-0.0037 **
MarketCapitaliza	0.0994	0.0974	0.0446	0.0929	0.0761	0.0682	0.0299	0.0920	0.0828	0.0731	0.0372	0.0927	0.1085 *	0.1233 *	0.0961	0.1310
OR	0.1331 **	0.1265 **	0.1127 **	0.0598	0.1176 **	0.1205 **	0.1311 **	0.0713 *	0.1098 **	0.1142 **	0.1201 **	0.0625	0.1648 ***	0.1570 **	0.1391 **	0.0736 *
ESGScore	0.0580															
EScore					0.1474 ***											
SScore									0.1360 ***							
GScore													-0.0436			
lag_esg1		0.1017 **														
lag_e1						0.1604 ***										
lag_s1										0.1608 ***						
lag_g1														0.0011		
lag_esg2			0.2287 ***													
lag_e2							0.2025 ***									
lag_s2											0.2347 ***					
lag_g2															0.1329 **	
lag_esg3				0.1864 ***												
lag_e3								0.1434 **								
lag_s3												0.2077 ***				
lag_g3																0.1146 **
_cons	-0.0085 **	-0.0028	0.0140	0.0277 **	-0.0006	0.0082	0.0205 **	0.0278 **	-0.0002	0.0112 **	0.0349 **	0.0528 **	-0.0144 ***	-0.0133 ***	-0.0115 **	0.0005
R-squared (withi	3.89%	5.06%	10.41%	6.86%	7.25%	8.01%	11.15%	5.84%	6.82%	8.14%	13.29%	9.19%	3.64%	3.67%	5.93%	4.24%
R-squared (betw	10.60%	11.79%	17.03%	12.30%	11.41%	11.22%	13.24%	6.18%	12.40%	12.57%	14.78%	9.33%	5.67%	6.83%	13.94%	9.16%
R-squared (overa	8.23%	9.64%	15.26%	11.18%	9.76%	10.03%	12.42%	6.09%	10.06%	10.83%	14.07%	9.18%	5.00%	5.90%	11.90%	8.23%
Model	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects

Source: (Table created by the author) Legend: * p<.1; ** p<.05; *** p<.001

(Table 6.2, FFO 2 years gap analysis)

ROA (2 y gap)	H1	H1.5	H1.6	H1.7	H2	H2.5	H2.6	H2.7	H3	H3.5	H3.6	H3.7	H4	H4.5	H4.6	H4.7
Lag (years)	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
CapRate	0.0337	0.0249	0.0431	0.4037 **	0.0334	0.0238	0.0403	0.3998 **	0.0335	0.0244	0.0420	0.4037 **	0.0327	0.0247	0.0442	0.4016 **
DebtEquity	0.0023 **	0.0013	0.4314	0.0501	0.0018	0.0010	0.4154	0.0511	0.0024 **	0.0013	0.4216	0.0487	0.0013	0.0009	0.4449	0.0534
DividendYield	0.0023	0.0061	0.0103	0.0101	0.0075	0.0108	0.0093	0.0114	0.0068	0.0091	0.0117	0.0111	0.0000	0.0041	0.0071	0.0086
FFOPayoutRatio	-0.0156 ***	-0.0162 ***	-0.0157 ***	-0.0155 ***	-0.0168 ***	-0.0168 ***	-0.0162 ***	-0.0160 ***	-0.0164 ***	-0.0164 ***	-0.0159 ***	-0.0157 ***	-0.0149 ***	-0.0159 ***	-0.0154 ***	-0.0152 ***
MarketCapitaliza	-0.0036	-0.0123	-0.0117	-0.0037	0.0008	-0.0023	0.0030	0.0082	-0.0008	-0.0092	-0.0077	0.0006	0.0017	-0.0088	-0.0110	-0.0034
OR	0.1348	0.2112 ***	0.2279 ***	0.1242 **	0.1541 *	0.2243 ***	0.2374 ***	0.1293 ***	0.1478 *	0.2180 ***	0.2318 ***	0.1265 **	0.1301	0.2082 ***	0.2243 ***	0.1230 **
ESGScore	0.0781 ***															
EScore					0.0257											
SScore									0.0396 **							
GScore													0.1014 ***			
lag_esg1		0.0488 **														
lag_e1						0.0074										
lag_s1										0.0299 *						
lag_g1														0.0638 **		
lag_esg2			0.0321													
lag_e2							-0.0076									
lag_s2											0.0194					
lag_g2															0.0500 *	
lag_esg3				0.0239												
lag_e3								-0.0079								
lag_s3												0.0128				
lag_g3																0.0340 *
_cons	0.0106 ***	0.0023	0.0157 *	0.0094 **	0.0073 ***	-0.0018	0.0094	0.0023	0.0088 ***	0.0018	0.0155 *	0.0084	0.0094 ***	0.0005	0.0142 *	0.0079 **
R-squared (withi	2.11%	6.41%	6.36%	7.33%	1.67%	6.05%	6.24%	7.27%	1.76%	6.22%	6.30%	7.28%	2.37%	6.63%	6.51%	7.40%
R-squared (betw	34.64%	36.89%	37.16%	19.75%	31.14%	34.73%	35.96%	18.80%	31.38%	34.53%	35.72%	18.54%	38.03%	39.24%	38.96%	21.29%
R-squared (overa	16.75%	26.54%	27.74%	16.45%	14.96%	24.96%	26.78%	15.65%	15.00%	24.86%	26.66%	15.50%	18.71%	28.27%	29.15%	17.65%
Model	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects

Source: (Table created by the author) Legend: * p<.1; ** p<.05; *** p<.001

(Table 6.3, ROA 2 years gap analysis)

CONCLUSIONS

The results of this thesis highlight how important ESG compliance is in determining how well REITs function. This study illustrates the observable advantages of incorporating sustainability practices into real estate investment strategies by examining the combined ESG scores in conjunction with its constituent environmental, social, and governance components. The findings show that ESG activities boost financial indicators including NAV, NOI, FFO, and AFFO in addition to improving operational efficiencies. These results demonstrate how crucial sustainability is becoming to generating long-term value for investors and other stakeholders in society.

One aspect of ESG that stands out as being very important is its environmental component, which continuously improves REIT performance. It has been demonstrated that programs like resource conservation techniques, green certifications, and energy-efficient retrofits reduce costs, draw in investors who are concerned about sustainability, and improve tenant happiness. Likewise, the social dimension contributes to operational stability and reputational strength by reaffirming the significance of staff development, tenant care, and community participation.

The governance component, on the other hand, offers a more complex picture, with its advantages becoming increasingly apparent over longer time horizons. Even if they might not result in immediate financial rewards, governance principles like board independence and openness are essential for maintaining regulatory compliance and building investor confidence. The significance of maintaining a commitment to governance reforms as a basis for operational resilience is shown by this delayed impact.

Furthermore, excluding 2020 and 2021 does not significantly change the direction of the impacts that have been seen; rather, it emphasizes a general decrease in the strength of ESG's relationship with ROA and a general decrease in the magnitude of its influence on NAV, NOI, and FFO. This implies that while the economic downturn may have momentarily increased the influence of ESG on short-term financial performance, its long-term advantages, particularly for asset profitability, remain strong even after adjusting for outside shocks.

This study's temporal analysis adds to our understanding of ESG dynamics by showing how sustainability practices frequently have more pronounced positive effects with time. Realizing the full potential of sustainability programs requires time and strategic alignment, as seen by the strong influence of ESG scores with a one- to two-year lag. These observations are consistent with the larger trend of ESG integration in financial markets, which prioritizes long-term value generation over immediate profits.

Practically speaking, the results provide investors, legislators, and REIT managers with useful suggestions. In a market that is becoming more and more concerned with sustainability, managers can improve their competitive positioning and draw in capital by giving ESG efforts top priority. ESG indicators offer investors a useful framework for evaluating the ethical alignment and long-term feasibility of investment options. The report emphasizes for policymakers the necessity of encouraging laws and incentives that promote the broad implementation of sustainable practices in the real estate industry.

In summary, ESG compliance is now a strategic need for REITs, bringing financial performance into line with environmental and societal objectives, rather than an optional factor.

Integrating sustainability into fundamental business strategies will be crucial as the real estate sector develops in order to achieve resilience, growth, and stakeholder confidence. By adding to the increasing amount of data demonstrating the operational and financial advantages of ESG practices, this thesis opens the door for further investigation into new facets of sustainability and how they relate to real estate investing.

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APPENDIX

NOI	H1	H1.5	H1.6	H1.7	H2	H2.5	H2.6	H2.7	H3	H3.5	H3.6	H3.7	H4	H4.5	H4.6	H4.7
Lag (years)	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
CapRate	0.0093872	0.01266757	0.01468251	0.01290693	0.01299718	0.01498568	0.01293704	0.01019526	0.01183681	0.01416408	0.01481304	0.01206309	0.00870711	0.01016925	0.01241371	0.01141146
DebtEquity	0.00245288 **	0.00306611 ***	0.14863969	0.1060856	0.00518062 ***	0.00545939 ***	0.0846547	0.08101256	0.00622275 ***	0.00571286 ***	0.1132736	0.09018399	0.00082189	0.00099462 *	0.16266944	0.12169823
DividendYield	-0.00954176	-0.01747835 *	-0.00854585	-0.00396515	-0.00805183	-0.00852317	0.0060867	0.00784094	-0.0075078	-0.01109928	0.00299134	0.00699711	-0.00123022	-0.00828593	-0.01068087	-0.00975419
FFOPayoutRatio	-0.0025505 **	-0.0001282	0.00232342	0.00327565	-0.00214175 *	-0.00192866	-0.00159893	-0.00110483	-0.00112384	1.89E-06	0.00123061	0.00221019	-0.00252552 **	-0.00068607	0.00215884	0.00346077 *
MarketCapitalization	0.07931636	0.06694566	0.04201546	0.05815329	0.06813549	0.05801979	0.04313746	0.07139379	0.0738569	0.06563641	0.05621817	0.07852844	0.10218084 *	0.11193559 *	0.10663309	0.12032724
OR	0.18816431 ***	0.17297442 ***	0.14895589 **	0.14240489 **	0.17815434 ***	0.1741167 **	0.16095966 **	0.14529201 **	0.16870461 **	0.16498453 **	0.15137078 **	0.13840612 **	0.1997178 ***	0.18317738 ***	0.15601984 **	0.14078219 **
ESGScore	0.10523303 **															
EScore					0.13822042 ***											
SScore									0.13607844 ***							
GScore													0.03026118			
lag_esg1		0.17180038 ***														
lag_e1						0.16589963 ***										
lag_s1										0.17541142 ***						
lag_g1														0.09821675 **		
lag_esg2			0.25838948 ***													
lag_e2							0.19235348 ***									
lag_s2											0.22017487 ***					
lag_g2															0.19881279 ***	
lag_esg3				0.24874762 ***												
lag_e3								0.17675373 ***								
lag_s3												0.21248506 ***				
lag_g3																0.19613135 ***
_cons	-0.15287217	-0.14416062	-0.12597782	-0.1071776	8.44E-16	0.01384899 ***	0.03289422 ***	0.06043446 ***	5.46E-16	0.01397001 ***	0.03355374 ***	0.0636671 ***	7.91E-16	0.01079241 ***	0.02308989 ***	0.04390084 ***
R-squared (whitin)	0.07301212	0.09944544	0.1418076	0.12500151	0.09539658	0.11263048	0.12691643	0.10341361	0.09603301	0.12162372	0.15179392	0.13083569	0.05692382	0.06915748	0.09721896	0.08933089
R-squared (between)	0.15322875	0.15825642	0.1608434	0.14949481	0.14708748	0.14288318	0.1398727	0.11578239	0.1579098	0.15782414	0.1551882	0.13391929	0.12058429	0.12107975	0.1251725	0.11253674
R-squared (overall)	0.1294846	0.14228735	0.1556543	0.14368867	0.12903385	0.13172557	0.13297151	0.11050137	0.134989	0.14331584	0.14924943	0.12914712	0.10186822	0.10787246	0.11911904	0.10806176
Model	random effects	random effects	random effects	random effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects	fixed effects

Source: (Table created by the author) — Legend: * p<.1; ** p<.05; *** p<.001

(Table 7.0, NOI H1 random effect, H2 to H4 fixed effect)

NAV	H1	H1.5	H1.6	H1.7	H2	H2.5	H2.6	H2.7	H3	H3.5	H3.6	H3.7	H4	H4.5	H4.6	H4.7
Lag (years)	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
CapRate	0.0089492	0.01106615	0.01157861	0.0105179	0.01077875	0.0118284	0.01045551	0.00890094	0.00962786	0.01063446	0.01067855	0.00929496	0.00721509	0.00916489	0.01037251	0.00994127
DebtEquity	0.01761542 ***	0.01867079 ***	-0.00958419	0.03253139	0.01858503 ***	0.01980444 ***	-0.04091976	0.0230264	0.01884613 ***	0.01942034 ***	-0.02835325	0.02742639	0.01560137 ***	0.01690979 ***	0.00193822	0.04043556
DividendYield	-0.01074198	-0.01348772	-0.00057645	0.00492517	-0.00612487	-0.00620799	0.00667191	0.00994211	-0.00511069	-0.00652542	0.00465777	0.0087264	-0.00975136	-0.01191153	-0.00382546	0.00051319
FFOPayoutRatio	0.07100478 ***	0.0706118 ***	0.06859056 ***	0.06562418 ***	0.07010399 ***	0.06839433 ***	0.06596391 ***	0.06287955 ***	0.0706661 ***	0.06929939 ***	0.06698941 ***	0.06403327 ***	0.07086863 ***	0.07059446 ***	0.06874027 ***	0.06601764 ***
MarketCapitalization	0.07601878	0.04946685	0.05358267	0.07070951	0.06888145	0.04126815	0.04869937	0.07132839	0.07693	0.05412123	0.06416139	0.08028568	0.08826153 *	0.06886009 *	0.0756771	0.08709365
OR	0.24230298 ***	0.23973555 ***	0.24295569 ***	0.25366325 ***	0.25763711 ***	0.25420701 ***	0.25748756 ***	0.26506601 ***	0.25440343 ***	0.25269292 ***	0.25659323 ***	0.26356993 ***	0.24693535 ***	0.24606922 ***	0.24764846 ***	0.2554872 ***
ESGScore	0.11909893 **															
EScore					0.09936542 **											
SScore									0.08604289 **							
GScore													0.11116703 **			
lag_esg1		0.13073398 **														
lag_e1						0.10849009 **										
lag_s1										0.09553911 **						
lag_g1														0.11404887 **		
lag_esg2			0.13588089 ***													
lag_e2							0.09918467 **									
lag_s2											0.09189955 **					
lag_g2															0.1244451 **	
lag_esg3				0.11952678 **												
lag_e3								0.07817295 **								
lag_s3												0.0799104 **				
lag_g3																0.1150254 **
_cons	-0.06443824	-0.06310652	-0.06458869	-0.06058731	-0.06514032	-0.06307673	-0.06536139	-0.06303663	-0.06876269	-0.06742836	-0.06871686	-0.06386437	-0.06590712	-0.06696213	-0.06978046	-0.06795355
R-squared (whitin)	0.09312642	0.08839086	0.08313091	0.07894869	0.09177017	0.08822699	0.08080796	0.07510755	0.08787202	0.08421374	0.07852021	0.07498988	0.08816203	0.08122672	0.07736951	0.07607068
R-squared (between)	0.09739168	0.09781463	0.10349573	0.09919178	0.07697893	0.07657916	0.08145592	0.08028703	0.08488341	0.08469642	0.08859372	0.08592199	0.10424642	0.1040721	0.10935893	0.10438543
R-squared (overall)	0.09575854	0.09457766	0.09685872	0.09286236	0.08163259	0.08002501	0.0809653	0.07840353	0.08576725	0.08440835	0.08525746	0.08241688	0.09853517	0.09646511	0.09905354	0.09563808
Model	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects

Source: (Table created by the author) — Legend: * p<.1; ** p<.05; *** p<.001

(Table 7.1, NAV random effect regression)

(Table 7.2, FFO random effect regression)

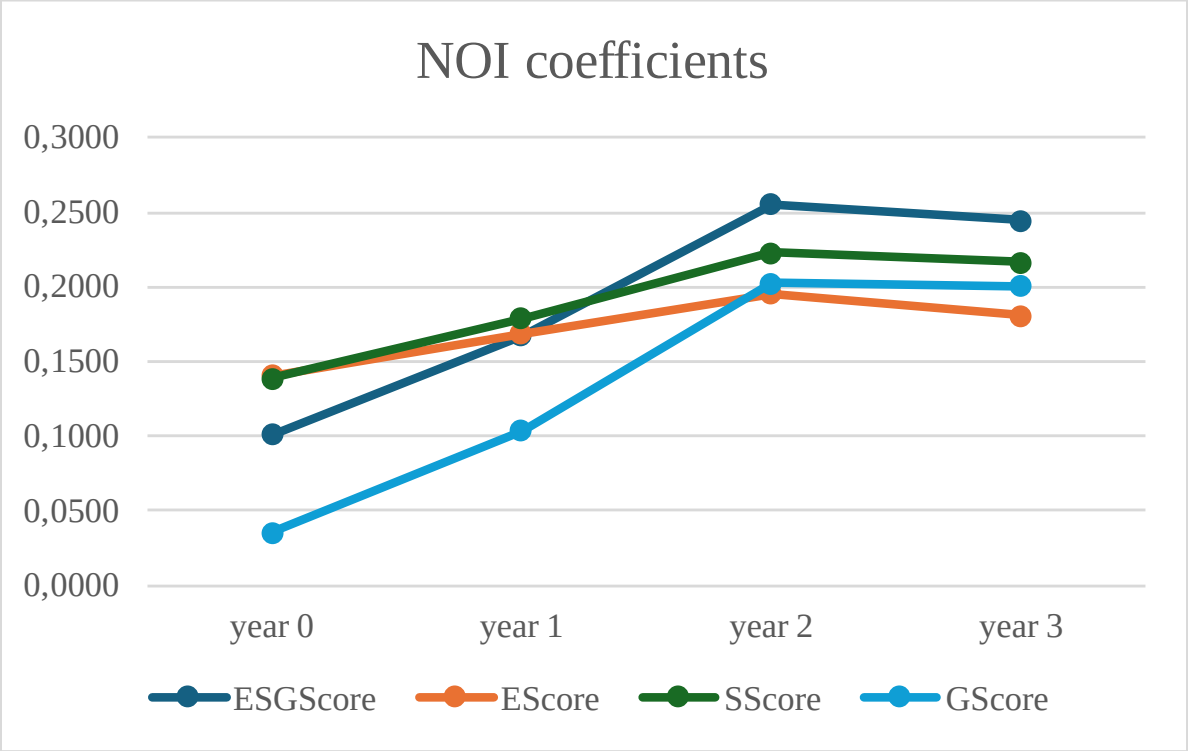
FFO	H1	H1.5	H1.6	H1.7	H2	H2.5	H2.6	H2.7	H3	H3.5	H3.6	H3.7	H4	H4.5	H4.6	H4.7
Lag (years)	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
CapRate	0.00147856	0.00439837	0.00692555	0.00538671	0.00501972	0.00699146	0.00573181	0.00309837	0.00357043	0.00592815	0.00739771	0.00494768	0.00068589	0.00147021	0.00354609	0.00282022
DebtEquity	-0.01908134 ***	-0.02019978 ***	0.11824867	0.07024643	-0.01611678 ***	-0.01773204 ***	0.05989425	0.04721324	-0.01523992 ***	-0.01761494 ***	0.0884557	0.05612595	-0.02063677 ***	-0.0222047 ***	0.12107737	0.08079817
DividendYield	-0.01967097 *	-0.02759139 **	-0.02738532 **	-0.02437539 *	-0.02143582 *	-0.02240837 **	-0.01348492	-0.01260651	-0.02093639 *	-0.02516131 **	-0.01776526	-0.01438074	-0.01085651	-0.01807034 *	-0.02910183 **	-0.03008817 **
FFOPayoutRatio	-0.00593851 ***	-0.00443146 **	-0.00222073	-0.00210384	-0.00602599 ***	-0.00645432 ***	-0.0065121 ***	-0.00692365 ***	-0.00506488 ***	-0.00461326 **	-0.00362279 **	-0.00348153 *	-0.00706318 ***	-0.00623677 ***	-0.0038037 **	-0.0033542
MarketCapitalization	0.09828321	0.09192387	0.07028668	0.08587929	0.07361478	0.06542017	0.04759611	0.07220322	0.0829343	0.07719881	0.06702793	0.08357901	0.11269235 *	0.12245808	0.11916636	0.12655304
OR	0.14375332 ***	0.12700623 **	0.1072561 **	0.10442822 **	0.13838324 ***	0.1333954 **	0.12660534 **	0.12022934 ***	0.1305457 **	0.12524165 **	0.11724017 **	0.11198125 **	0.1703081 ***	0.15098727 ***	0.12958591 **	0.11857811 **
ESGScore	0.08686174 **															
EScore					0.14683635 ***											
SScore									0.13927819 ***							
GScore													-0.00083956			
lag_esg1		0.14660984 ***														
lag_e1						0.1676084 ***										
lag_s1										0.17319528 ***						
lag_g1														0.06226403		
lag_esg2			0.24148193 ***													
lag_e2							0.20750973 ***									
lag_s2											0.2300908 ***					
lag_g2															0.15945123 **	
lag_esg3				0.22850424 ***												
lag_e3								0.18587702 ***								
lag_s3												0.22228739 ***				
lag_g3																0.15985761 **
_cons	-0.17378812 *	-0.16507045	-0.14981289	-0.13581818	-0.16913857	-0.16048107	-0.14746296	-0.13393678	-0.17400489 *	-0.1654278	-0.15089024	-0.13051608	-0.17945963 *	-0.17345745	-0.16280911	-0.15474695
R-squared (whitin)	0.03447884	0.04596174	0.07122545	0.0591396	0.05680337	0.06290753	0.07647549	0.05773016	0.05463963	0.0663997	0.089504	0.07441829	0.02745489	0.02918544	0.03998231	0.03568928
R-squared (between)	0.12775191	0.1389581	0.15786925	0.14496362	0.13274234	0.12902307	0.13138495	0.1111285	0.14302293	0.14400446	0.14905393	0.13146383	0.08946318	0.10109869	0.12548949	0.1168474
R-squared (overall)	0.09178432	0.10567116	0.1296221	0.11912135	0.10267873	0.10459193	0.11227579	0.09442839	0.10668672	0.11409696	0.12758372	0.11280853	0.06642891	0.07638248	0.0984226	0.0932202
Model	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects

Source: (Table created by the author) Legend: * p<.1; ** p<.05; *** p<.001

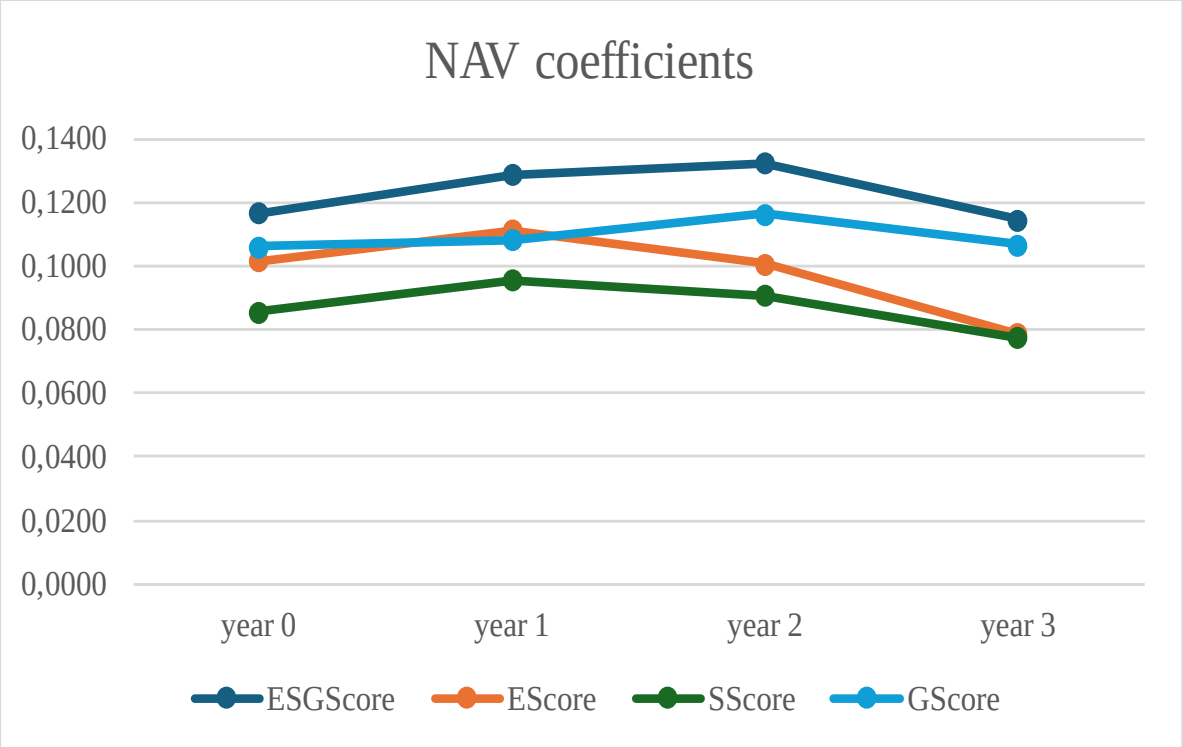
(Table 7.3, ROA random effect regression)

ROA	H1	H1.5	H1.6	H1.7	H2	H2.5	H2.6	H2.7	H3	H3.5	H3.6	H3.7	H4	H4.5	H4.6	H4.7
Lag (years)	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
CapRate	0.03207785	0.02597301	0.02081484	0.01747173	0.03169228	0.02464476	0.01968452	0.01655232	0.03199198	0.02533682	0.02019098	0.01691214	0.03059158	0.0258707	0.02130379	0.01810822
DebtEquity	0.00118324	0.00100279	0.23177939	0.24392275	0.00014564	0.00022253	0.22850646	0.24638455	0.00078409	0.00078175	0.22764019	0.24445626	-0.00001601	0.00049015	0.24314796	0.24607547
DividendYield	-0.00142737	0.00393087	0.00969286	0.00332286	0.00557512	0.00900252	0.0103065	0.00233155	0.00430378	0.00739592	0.01063672	0.0032444	-0.00590154	0.00001151	0.00676297	0.00149495
FFOPayoutRatio	-0.01874226 ***	-0.01657843 ***	-0.01495421 ***	-0.01327011 ***	-0.01975009 ***	-0.01754313 ***	-0.01572004 ***	-0.01384669 ***	-0.01946713 ***	-0.01724726 ***	-0.01551995 ***	-0.0137662 ***	-0.01817239 ***	-0.0156552 ***	-0.01400439 ***	-0.01237582 ***
MarketCapitalization	-0.02838492 ***	-0.02437501 **	-0.02522565 **	-0.02345092 **	-0.01739507 **	-0.0102947	-0.00978414	-0.01005589	-0.02059322 ***	-0.017416 **	-0.01800361 **	-0.0174471 **	-0.02512451 ***	-0.02396979 ***	-0.02686436 ***	-0.02613062 ***
OR	0.20574915 ***	0.22787454 ***	0.22506731 ***	0.22568792 ***	0.22533672 ***	0.23968236 ***	0.23351627 ***	0.23085021 ***	0.22038573 ***	0.23504389 ***	0.23005692 ***	0.22864103 ***	0.19652671 ***	0.22151688 ***	0.2196177 ***	0.22225848 ***
ESGScore	0.06892786 ***															
EScore					0.00235105											
SScore									0.01876405							
GScore													0.11255371 ***			
lag_esg1		0.03917912 *														
lag_e1						-0.00878557										
lag_s1										0.01176728						
lag_g1														0.07145142 **		
lag_esg2			0.02620878													
lag_e2							-0.0150228									
lag_s2											0.0032964					
lag_g2															0.05871867 **	
lag_esg3				0.01585796												
lag_e3								-0.01994526								
lag_s3												-0.00384973				
lag_g3																0.04399779 **
_cons	0.02701487	-0.01693935	-0.0128232	-0.01300384	0.02269376	-0.0210982	-0.01711141	-0.01880515	0.02324871	-0.01940041	-0.01496496	-0.01581818	0.02893238	-0.01578037	-0.01175638	-0.01178123
R-squared (whitin)	0.02112395	0.06057741	0.05485793	0.05164515	0.01826997	0.05912328	0.05519759	0.05276936	0.01867888	0.05929703	0.05468729	0.05193442	0.02429127	0.06342912	0.05618023	0.05200724
R-squared (between)	0.33010871	0.31778928	0.29386416	0.26627442	0.30384099	0.30210272	0.28448443	0.26183066	0.30380828	0.300762	0.28255571	0.25942409	0.36746406	0.34765702	0.32100443	0.28950378
R-squared (overall)	0.17085185	0.23358087	0.22176235	0.2072439	0.15672277	0.22201211	0.21429826	0.20334657	0.15681791	0.221386	0.21323878	0.20182445	0.19159074	0.25527684	0.2420928	0.22496203
Model	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects	random effects

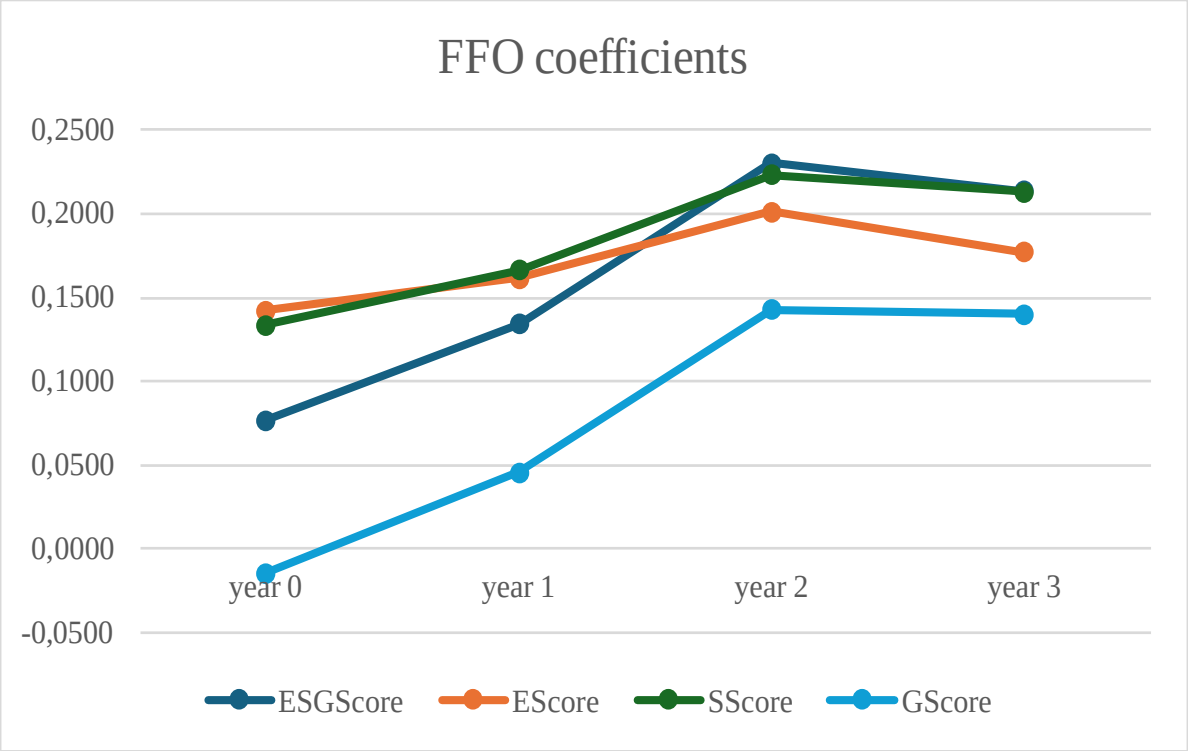
Source: (Table created by the author) Legend: * p<.1; ** p<.05; *** p<.001



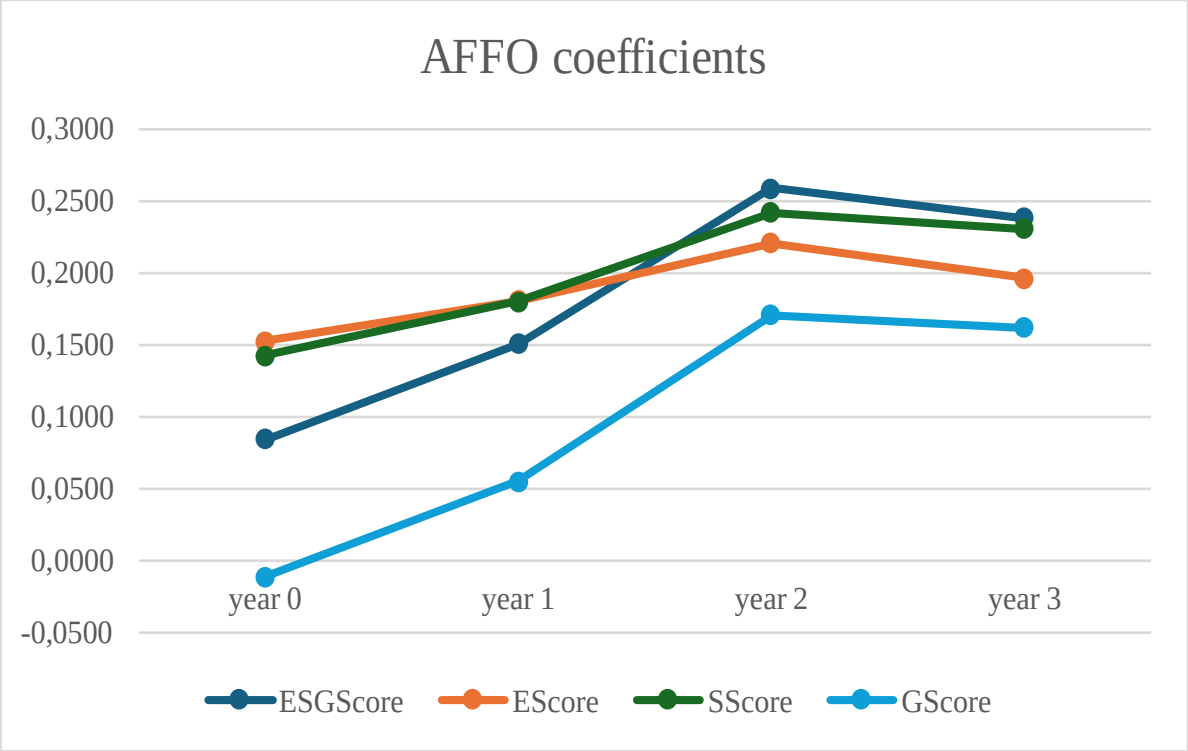
(Chart 8.0, NOI coefficients)



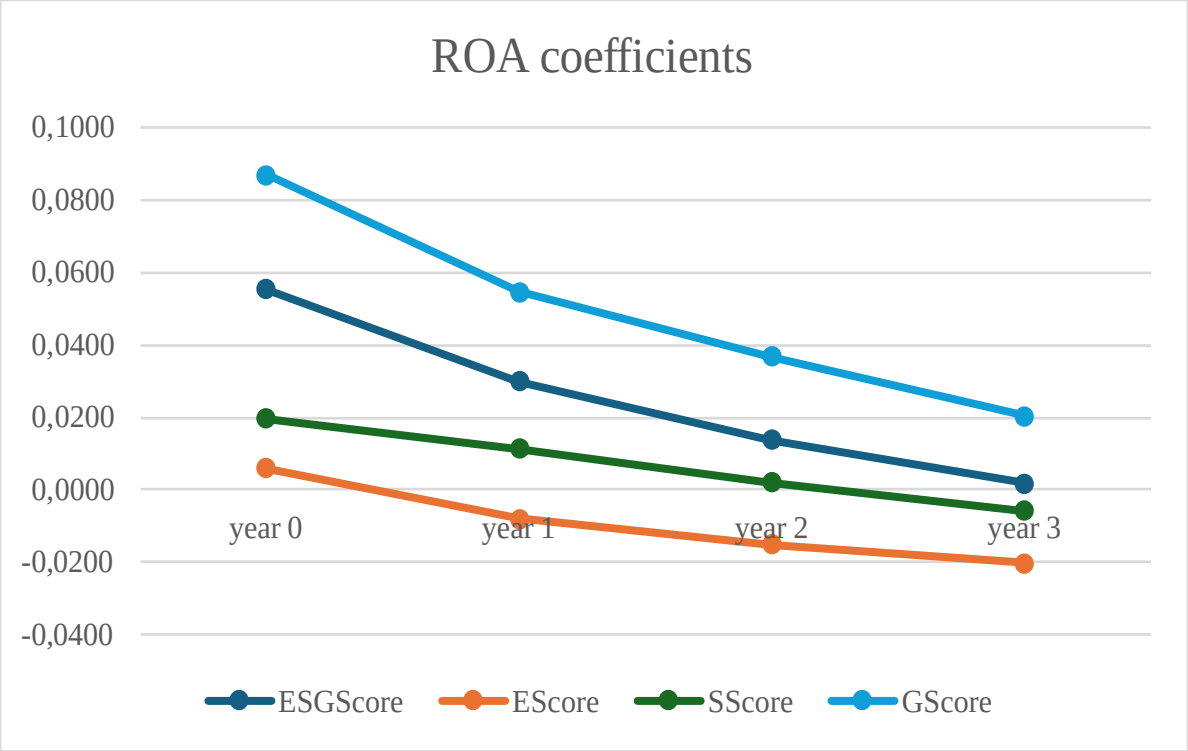
(Chart 8.1, NAV coefficients)



(Chart 8.2, FFO coefficients)



(Chart 8.3, AFFO coefficients)



(Chart 8.4, ROA coefficients)