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Can Corporate Sustainability Drive Economic Value Added? Evidence from Larger European Firms

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Abstract: This study analyses the association between firms' sustainability and economic performance in Europe, considering the channels of margin and turnover. The sample is composed of firms listed in the STOXX Europe 600 Index from 2012 to 2020. The sustainability performance is captured by the combined and individual ESG scores from Refinitiv, and dynamically tested with proxies of economic performance, including economic value added, return on firms' assets and its components, margin and turnover. The methodological approach comprises different panel data specifications and tackles the potentially unobserved, time-invariant heterogeneity, endogeneity concerns, and reverse causality biases. Our findings point to a strong positive association between firms' sustainability and economic performance in Europe, although the individual ESG forces are not at play with the same intensity. The environmental pillar is the one that is systematically associated with better economic performance across all estimations. The influence of sustainability performance on economic performance is also channeled by both profit margin and turnover. We find that a 1% improvement in the ESG score yields an increase in the economic value added of 0.08%, EVA over revenues. In general, our findings point to a shift from the conventional business model perspective to the incorporation of a core sustainability proposition and agenda that brings advantages and drives economic performance.

Keywords: ESG; corporate sustainability; economic performance; return on assets; economic value added (EVA)

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1. Introduction

Sustainability has become an unmatched priority and a matter of urgency across the globe. The concept is comprehensive and is seen as a multidimensional construct. The 2050 Paris Agreement and the 2030 UN Agenda for Sustainable Development are recent events shaping the challenges faced by firms' to sustaining their operations and strategy. Furthermore, this new narrative has emerged across the business sector as one of the most pressing themes to be tackled in the 21st century, driven by stakeholders' increasing demands for enterprise legitimacy and socially responsible behavior. Thus, the latest trend in corporate action centers on environmental, social, and governance concerns, labeled with the acronym ESG. These three central non-financial factors for measuring corporate sustainability and societal impact are already ingrained in the business community, the media, by policy makers, and the academic sphere (Matos et al. 2020; Gonçalves et al. 2021a).

The debate over sustainable performance has shifted from a more traditional financial perspective to a more refined outlook on socio-economic outcomes (Wang et al. 2016). However, the empirical evidence on the association between sustainability and economic performance remains scarce and unclear to the present day (Fuente et al. 2022). Therefore, we answer the call to better understand the role of green finance on corporate performance, and how firms adapt to climate change risks and their consequences (Venturini 2022). The

absence of moderating effects (McWilliams and Siegel 2001; Ferrero-Ferrero et al. 2016), the causality of the well-known argument "doing well by doing good" (Matos 2020), and the comprehensive nature of economic performance are frequent arguments to justify the heterogeneity of results. Nevertheless, a positive and statistically significant pattern is noted in the prior literature, often in light of the advocates of stakeholder theory (Freeman 1984; Jones 1995; Gonçalves and Gaio 2023).

There is scarce literature considering the operating impacts of sustainability performance on economic performance, especially looking at the channels (profitability or efficiency) through which sustainability propositions are relevant. In addition, there is an open debate on the issue of whether investing in a holistic view of corporate sustainability can effectively add value to firms through the traditional lenses of economic profit. Our study aims to fill this gap, especially considering the two main channels of economic profit, margin and turnover. The analysis is run in a pan-European context, exclusively looking at larger firms to contain the potential size and market visibility biases. The sample employs data from 399 unique firms currently listed on the STOXX Euro 600 Index during the period 2012 to 2020, covering 9 industry sectors in 17 countries in the European Union. Overall, 2761 firm-year observations are included.

Our results are robust in suggesting a statistically positive relationship between a firm's sustainability and their economic performance. We find that a 1% improvement in the ESG score yields an increase in the economic value added of 0.08%, EVA over revenues. Similar to Fischer and Sawczyn (2013), Dalal and Thaker (2019), and Ferrero-Ferrero et al. (2016), we find support for the argument that increased standards of socially responsible behavior strategically drive economic results. Hence, and contrary to the view that corporate sustainability presupposes the redirection of assets and resources (Allouche and Laroche 2005), the evidence suggests that planning and acting responsibly enhances the effective and sustainable allocation of capital in the long run. Additional analyses shed light on the channels of economic performance that are likely to be affected by sustainability performance, both net profit margin and asset turnover. These two dimensions are relevant because they account for the business model. As better turnover is characterized by firms operating in industries offering more standardized products and offering a competitive advantage on cost leadership, better margins may be found in less competitive industries or within firms with a differentiated product. Integrating solid sustainable propositions, in fact, benefits the bottom line profit margin without negatively impacting cost-benefit trade-offs. Our results suggest that firms are prone to building competitive advantage and enhancing economic performance, primarily due to the mediating effects on profitability and asset efficiency. The ESG pillars mediating the relationship include enhanced differentiation and innovation, legitimacy, and brand reputation, aligned with changes in consumption patterns and expectations, increased policies, and the degree of regulation.

The results remain similar after promoting a battery of robustness tests. First, we employed fixed and random effects regressors to control potentially correlated, unobserved, and time-invariant heterogeneity (Arellano 2003). Secondly, we ensured that the findings were unchangeable after controlling and testing for endogeneity concerns and reverse causality biases (Arellano and Bond 1991). To tackle this robustness analysis, we implemented a two-step dynamic generalized method of moments (GMM), following Nuskiya et al. (2021) and Gerged et al. (2021). Lastly, these findings remained congruous and stable when controlled for time-window biases, when the momentum and popularity of "going sustainable" reached new levels after 2015, as suggested by Gonçalves et al. (2021b).

Our study contributes to a growing body of knowledge in the academic literature. First, it contributes to clarifying the current understanding of the topic that remains scant and inconclusive (Dalal and Thaker 2019; Fischer and Sawczyn 2013; Lioui and Sharma 2012) for a group of large, capitalized firms within the European context. We go beyond a traditional financial perspective, contesting the evidence presented by Lioui and Sharma (2012). The results are robust and consistent for alternative measures of economic performance, numerous econometric specifications, and the overall and individual dimensions

of corporate sustainability. We take the additional step of looking at two main channels that may drive our results, profitability and efficiency. We find that sustainability translates into higher profit margins and, at the same time, it enhances asset turnover as a measure of resource usage efficiency. To the best of our knowledge, this research is the first to introduce both economic value added and ESG scores, with the aim of providing an innovative value-added perspective.

Our study also carries managerial implications, as our results suggest that investing in sustainability yields non-negligible economic benefits. Especially considering new developments in the European regulatory landscape for sustainability issues, which will require all companies in our sample to provide KPIs on turnover, CAPEX, and OPEX aligned with the European taxonomy, managers should view these requirements not as a cost-driven strategy but rather as an addition to economic value. Consequently, firms can benefit by incorporating sustainability issues into their corporate strategies and culture (Rodrigues and Franco 2019), for which the involvement of top-level management is paramount (Miller et al. 2008).

This paper proceeds as follows, the literature review is presented in Section 2, and the sample and research methodology are explained in Section 3. Section 4 discusses the results. Section 5 draws conclusions, assesses the study's contribution and limitations, and suggests avenues for further research.

2. Literature Review and Hypotheses

The effective development of sustainability considerations in contemporaneous organizations goes back just a few years. Especially, since the issuance of willpower statements by powerful leaders. In 2020, Larry Fink, the chairperson and CEO of BlackRock, the world's largest fund manager, reiterated his company's commitment to sustainability in its annual shareholders' letter entitled, "A Fundamental Reshaping of Finance". The latest trend in corporate action came in the shape of ESG, environmental, social, and governance, the three central non-financial factors to measure sustainability and a firm's societal impact. It has quickly become ingrained in the business and academic community, and is regularly found in the talking points of the media and on policy makers' agendas (Matos et al. 2020). Several organizations have developed this approach, including the UN Global Compact, the Global Reporting Initiative (GRI), and the UN Environment and Program Finance Initiative (UNEP FI). There is no clear consensus on the materiality and scope of each ESG constituent, although Matos (2020) has attempted to shed light on this issue. The environmental pillar includes: climate change and carbon emissions; natural resource use, and energy and water management; pollution and waste; eco-design; and innovation. The social pillar concerns the health and safety, diversity and training of the firm's workforce, customer and product responsibility, community relations, and charitable activities. The corporate governance pillar now incorporates shareholder rights, the composition of boards of directors, management compensation policy, fraud, and bribery (Matos 2020).

A meta-analysis study developed by Friede et al. (2015) documented that 90% of the existing research points to a non-negative relationship between sustainability and financial performance. These results also indicate that the most positive findings appear stable over time. Orlitzky et al. (2003), integrating 30 years of research across different industries and study contexts, added considerable weight to the thesis of a positive association between corporate social performance and financial performance. According to these authors, this association tends to be simultaneous and bidirectional, with reputation as an essential mediator. Margolis et al. (2008) identified a diverse set of effects and emphasized that the reality of this interrelation was one of complexity, although the authors argue for a moderately positive impact.

Based on the GRI, Fischer and Sawczyn (2013) revealed that satisfying growing stakeholder requirements on transparency and the firm's socially responsible behavior drives reputation and financial results. Investing in corporate social responsibility enhances transparency standards, which benefits stock prices (Benkraiem et al. 2022). Moreover, better

ESG delivers less risk in terms of managerial opportunism (Gonçalves et al. 2021a). Brogi and Lagasio (2019) focused on the industrial and financial sector and reported that ESG strengths enhance profitability and drive stakeholder value. Following a similar research design, Dalal and Thaker (2019) and Velte (2017) have added weight to previous findings. Gonçalves et al. (2021b) show that green investing risk-adjusted returns are higher than their conventional peers. On the other hand, Lioui and Sharma (2012) identified that environmental corporate social responsibility negatively impacts a firm's financial results, although they note a positive indirect effect as a consequence of increased research and development efforts, which generates additional value. In fact, Bueno-García et al. (2022) found that strategic shareholders positively drive the proactivity of firms towards environmental practices, which is not verified by financial shareholders depending on the level of foreign market exposure.

Ng and Rezaee (2015), El Ghoul et al. (2011), and Clark and Viehs (2014) extended the scope of previous research and evaluated the association between corporate sustainability and firms' financing ability. The evidence suggests that increased sustainability performance benefits from a cost of capital standpoint, reflecting the non-participation in sin industries, a higher investor base, and lower perceived risk (El Ghoul et al. 2011; Gonçalves et al. 2022).

However, the empirical research regarding sustainability and financial performance has yielded different findings over time. McWilliams and Siegel (2001) noted that the heterogeneity of the results in the prior literature is the outcome of flawed empirical analysis, and they suggest that econometric modeling misspecifications result in upwardly biased estimations. Yet, it should be noted that, instead of a linear dependence, some researchers advance the possibility of a U-shaped pattern (Taliento et al. 2019; Gonçalves et al. 2022).

The debate on sustainable performance has shifted from a more traditional financial perspective to a more refined outlook on socio-economic outcomes (Wang et al. 2016). In this sense, economic performance encapsulates a more comprehensive nature, considering both financial and non-financial performance (Yawika and Handayani 2019). As a result, recent studies have examined this dimension of measuring a firm's financial health, as well as its ability to promote sustainable growth, and, consequently, deliver long-term shareholder value (Ferrero-Ferrero et al. 2016; Tarmuji et al. 2016; Cek and Eyupoglu 2020; Sila and Cek 2017). Ferrero-Ferrero et al. (2016) suggested that ESG strengths are positively associated with economic performance. Moreover, García-Ramos and Díaz (2021) highlight the different theoretical arguments and the mixed results in a wide range of academic literature on the impact of governance on performance.

Following this trend, Cek and Eyupoglu (2020) reported a statistically significant and positive effect when considering the overall ESG score for the US, although the evidence demonstrated that only social and governance performance yields economic benefits on an individual level. Sila and Cek (2017), using a similar research design for Australia, found that social performance consistently drives economic results, while environmental factors also have a statistically significant and positive effect, but to a lesser extent. Finally, Tarmuji et al. (2016) reinforced the heterogeneity of the results by showing that only governance and social dimensions appear to be statistically significant and positively associated with Malaysia's and Singapore's economic performance.

In contrast to the prior literature, Yawika and Handayani (2019), focused on a high-profile industry in Indonesia, and found that firms or investors failed to consider environmental and social performance. They found that corporate governance exhibited contradictory results. Taliento et al. (2019) examined the evidence on corporate sustainability advantages between 2014 and 2017 in Europe. The authors' analysis is interesting in that the individual ESG scores, on balance, are not impactful in absolute terms. Despite the excess or abnormal ESG performance, the distance from the industry average figures is significant and positively relevant, shedding light on the notion of competitive advantages from a sustainability strategy perspective.

Al-Tuwaijri et al. (2004) investigated the interrelation between economic and environmental performance and disclosure. The authors advanced a positive and statistically significant association using this framework, which was consistent with the view that both are related to the quality of management and investor preferences for equities in environmentally responsible firms.

Alsayegh et al. (2020), drawing on a sample of Asian firms, reported a statistically meaningful and positive relationship between environmental, social, and economic sustainable performance, thus indicating an interdependence between creating societal value and economic value. Furthermore, the authors emphasized that ESG-responsible firms may benefit from numerous competitive advantages, namely, increased efficiency and competitiveness, improved reputation and consumer trust, and reduced financial risks and operating costs. El Ghoul et al. (2017) also found evidence that the association between CSR and firm value is more meaningful in countries with weaker market institutions. These findings are derived from various channels, such as improved access to financing, greater investment, lower default risk, and higher future sales growth. Ding et al. (2016) found that, in terms of firm value benefits, it pays to be different when investing in corporate social responsibility, although it depends on the industry-specific relative position of the firm. Risk reduction benefits that connect inversely with firm value are found to be more impactful in controversial industries (Jo and Na 2012). Fuente et al. (2022) argue that ESG performance and growth options value should be modeled as a U-shaped relationship. Moreover, Ayton et al. (2022) suggest that sustainability performance mitigates idiosyncratic risk, while not effectively tackling systematic risk. Tzouvanas and Mamatzakis (2021) found that better environmental performance leads stocks to exhibit lower idiosyncratic risk, although their systematic risk is higher.

Blasi et al. (2018) examined the relationship between corporate social responsibility and economic performance by adopting seven macro-categories. They also incorporated accounting and market-based performance measures, as well as each firm's economic sector. The evidence indicates that integrating socially responsible corporate behavior enhances total stock returns and reduces financial risks.

López-Arceiz et al. (2018) stated that the strength of the association between social and economic performance tends to change according to the measurement criteria of the latter. Hence, capturing economic performance is not free of challenges, and previous evidence consolidates the argument for a multidimensional construct (Moneva and Ortas (2010) cited in López-Arceiz et al. 2018).

Moreover, scarce prior literature has included value-added measures, namely Economic Value Added (EVA®) and Market Valued Added (MVA), to comprehend a firm's economic performance. Mittal et al. (2008) examined whether having a code of ethics in a firm's annual reports translates into better economic performance in India. Dewi (2013) in Indonesia, and Strouhal et al. (2015) in the Czech Republic and Estonia, assessed the influence of corporate social responsibility performance and disclosure on a firm's economic results. However, on balance, this stream of research does not support the interrelation of the two factors when considering a value-added approach. Yet, a firm's characteristics primarily explain their ESG disclosure (Yu and Luu 2021).

Furthermore, Carini et al. (2017) relied on a representative sample of the intersection between two of the three main international indexes for CSR (Domini 400 Social Index, Dow Jones Sustainability World Index, FTSE4Good Index), intending to overcome the multiplicity of definitions and certifications. They demonstrated that a firm's socially responsible behavior affects economic performance, primarily focusing on a market-based perspective. Thus, firms with improved sustainability are more virtuous and achieve long-term performance, where reputation seems to be the fundamental driver. Finally, an article published by Mishra (2020) suggests that ESG performance enhances economic value added and, consequently, drives firm value.

As previously documented, the conclusions from the literature on the association between corporate sustainability and economic performance remains mixed. The absence

of moderating effects (McWilliams and Siegel 2001; Ferrero-Ferrero et al. 2016), the causality of the well-known argument "doing well by doing good" (Matos 2020), and the comprehensive nature of economic performance, are arguments that are frequently advanced to justify the heterogeneity of the results. Although the evidence remains scarce and ambiguous today, a growing body of research has provided arguments for a statistically significant and positive relationship. Thus, increased stakeholder awareness of the need for firms to adopt socially responsible behavior, differentiation, and the reputational effects may represent a strong proposition that will enhance competitive advantage and drive economic performance. Built on the extant literature, this study proposes the following central research hypothesis:

H1: *There is a significant association between corporate sustainability and economic performance.*

Furthermore, considering the multidimensionality of corporate sustainability, Cek and Eyupoglu (2020) argued that previous findings are either inconclusive or misleading given that the concept has been studied as a single construct. There is no current consensus on which of the three ESG dimensions, environmental, social or governance, contributes more substantially to a firm's economic performance (Cek and Eyupoglu 2020; Yawika and Handayani 2019). The source of the inconclusive and distinctive results come from the idiosyncrasies that exist in regional and study contexts, socio-cultural factors, countries legal origins and institutional settings, economic development, industry intensity, and the degree of regulation. For this reason, to introduce increased evidence and robustness into the knowledge domain, we hypothesize that the association in H1 is also valid, whereas corporate sustainability is measured by the individual pillars of ESG, namely, environmental, social, and governance.

3. Sample and Methodology

The empirical research was built on data collected from Refinitiv between 2010 and 2020. To select the sample, we considered all constituents of the Euro Stoxx 600 Index, comprising 17 countries from the European region. Aiming to assure sample homogeneity, firms within the financial sector were removed to account for industry-specific regulatory settings, and firms in financial distress (negative equity) were eliminated to overcome bias derived from the economic conditions (Gaio et al. 2022). Observations were further removed from the original sample because of a lack of ESG scores, economic performance metrics, and the unavailability of control variables.

The database from Refinitiv Eikon provides comprehensive analytical data to classify firms' ESG performance, commitment, and effectiveness based on verifiable reported data in the public domain. The underlying ESG data framework comprises more than 450 firm-level ESG metrics. A percentile rank methodology was conducted, employing 186 comparable measures, grouped into 10 categories. The scoring is based on the relative sum of the category weights that vary across industries regarding the environmental and social categories, and country of incorporation peers concerning the governance dimensions. Table 1 presents variables definition. In our sample, the ESG score is on average (median) 63.5% (66.7%), while similar figures are found for the E (62.6%), S (67.1%), and G (57.9%) components (Table 2).

Table 1. Variables definition.

Variable	Definition
Dependent Variables	
ROA	Return on assets, as net income scaled by total assets
Net Profit Margin	Net profit margin, as net profit divided by total revenues
Asset Turnover	Asset turnover, as total revenues over total assets
EVA Margin	Economic Value Added (EVA), as (ROIC − WACC) × Invested Capital. The variable is further divided by total revenues to increase comparability

Table 1. *Cont.*

Variable	Definition
Sustainability Variables	
ESG Score	ESG combined score from Refinitiv Eikon
Environmental	Environmental pillar score from Refinitiv Eikon
Social	Social pillar score from Refinitiv Eikon
Governance	Governance pillar from Refinitiv Eikon
Control Variables	
Size	Size as the log of a firm's total assets
Leverage	Leverage as total debt divided by total assets
R&D	Research and development (R&D) margin as R&D over total revenues
CAPEX	CAPEX investment, as total CAPEX over total revenues. The ratio is multiplied by −1 to increase readability
Growth	Revenue growth from period t − 1 to period t

Table 2. Descriptive statistics.

Variables	Observations	Mean	Standard Deviation	Minimum	Median	Maximum
ROA	2761	0.068	0.120	−0.275	0.055	2.518
Net Profit Margin	2761	0.145	0.363	−6.393	0.087	4.154
Asset Turnover	2761	0.733	0.486	0.019	0.658	4.203
EVA Margin	1845	0.014	0.257	−6.917	0.031	0.581
ESG Score	2761	0.635	0.184	0.020	0.667	0.947
Environmental	2761	0.626	0.244	0.000	0.675	0.989
Social	2761	0.671	0.215	0.012	0.719	0.982
Governance	2761	0.579	0.220	0.038	0.605	0.979
Leverage	2761	0.257	0.145	0.000	0.246	0.811
Size	2761	23.01	1.433	17.65	22.93	26.93
CAPEX	2761	−0.092	0.174	−3.592	−0.054	0.000
R&D	2761	0.030	0.172	−0.037	0.000	6.105
Growth	2761	0.076	0.491	−0.872	0.045	22.16

Economic performance is constantly perceived as a multidimensional construct and, often, its measurement is ambiguous and uneven, as is reflected in the literature. Given the comprehensiveness of multiple drivers of economic activity (Taliento et al. 2019; McWilliams and Siegel 2001), this study has employed distinct and complementary economic performance metrics. The use of several measures aims to address the challenges posed by its measurement and increase the robustness of the results.

Return on assets (ROA), computed as earnings after taxes over total assets, represents a comprehensive picture of a firm's stable and continuous economic activity. To understand the drivers of ROA, we break it down into a firm's net profit margin (NPM) and asset turnover (AT), representing revenues over total assets. This approach disentangles profitability from efficiency, respectively. The average firm exhibits a 6.8% ROA, while NPM is 14.5% and AT is 0.73. It should be noted, however, that industry specificities may be driving AT (Table 2).

Economic value added (EVA), which represents a firm's economic profits, is usually measured as the spread between return on invested capital (ROIC) and the weighted average cost of capital (WACC), which is amplified in value by the invested capital (IC) of a firm (Stewart 2009). This approach reflects the risk-adjusted added value from the dynamic elements (Stewart 2009):

$$\text{EVA} = (\text{ROIC} - \text{WACC}) \times \text{IC} \quad (1)$$

The estimations of EVA are not free from debate; Stewart (1991) identified the necessary adjustments to overcome accounting distortions. However, Young (1999) claims that many adjustments are immaterial and, therefore, are not economically significant. This

provides solid ground for not considering any adjustments in the course of this research. Nevertheless, any bias estimation affects each firm equally, thus the results remain valid and conclusive. Furthermore, the need for a tailored EVA to account for each specific firm (Chari 2009) and to mitigate any potential limitations regarding the statistical properties of an income-based measure, led us to compute the EVA margin as the EVA from Equation (1) scaled by a firm's total revenues (Stewart 2009). The EVA margin is approximately 1.4%, although there is significant variability.

Regarding the measures of economic performance, firms, on average, exhibit a 6.8% return on assets, with a net profit margin of 14.5% and asset turnover of 0.73, while revenues are growing at 7.6% yearly. It should be noted that, due to unavailable data, economic valued added specifications contain fewer observations.

Table 3 presents the correlation matrix. Surprisingly, a preliminary data analysis presents a negative and statistically significant correlation between the ESG score and proxies for economic performance, except for the economic valued added variable. The correlation's magnitude depends on the measure of economic performance; thus, this initial inspection does not permit definitive conclusions.

To understand the association between a firm's sustainability performance and its economic performance, the following models were estimated based on multivariate regression analysis, controlled for firm-specific characteristics, year, and industry effects, as in Fischer and Sawczyn (2013), and Mittal et al. (2008):

$$\begin{aligned} Performance_{it} = \alpha_0 + \beta_1 ESG_{it} + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \beta_4 Growth_{it} \\ + \beta_5 R\&D_{it} + \beta_6 Capex_{it} + \beta_7 Industry_i + \beta_8 Year_i + \varepsilon_{it} \end{aligned} \quad (2)$$

where i denotes each firm and t the corresponding year. Performance is captured primarily by the ROA and EVA margin variables. To understand the extent to which a firm's ESG performance impacts different layers of economic activity, net profit margin (NPM) and asset turnover (AT) were used as complementary measures for economic performance. The ESG variable is replaced by its components, namely, environmental, social, and governance pillars, depending on the research question above. Table 1 details the definition of the variables used in this study. The firm-specific control variables are drawn from existing empirical evidence (McWilliams and Siegel 2001; Taliento et al. 2019; Lioui and Sharma 2012):

Size: The natural logarithm of a firm's total assets in thousands. Larger firms may benefit from economies of scale and scope, slack resources, and control over stakeholders (Taliento et al. 2019). However, larger companies are more exposed to media attention, pressure, and scrutiny, and they tend to comply with governance policies to a greater extent (Taliento et al. 2019; Carini et al. 2017). A positive association is expected between size and economic performance;

Leverage: Is total debt scaled by total assets. Highly leveraged firms are more likely to incur agency costs of debt and financial distress costs (El Ghoul et al. 2017). Moreover, the heavier financial burdens on these firms may induce vulnerability (Alsayegh et al. 2020) and reduce performance during uncertain times (Taliento et al. 2019). A negative association is anticipated, although a U-shaped relationship has been suggested in the literature;

R&D: Is the level of research and development (R&D) expenditures over a firm's revenues. Most of the empirical approaches in the prior research may be misspecified because the intensity of R&D is a significant determinant of performance (McWilliams and Siegel 2001) and influences economic growth in the medium to long run (Carini et al. 2017);

Growth: Revenue growth year-on-year (El Ghoul et al. 2017; Ferrero-Ferrero et al. 2016) is expected to drive economic performance;

CAPEX: Is a proxy for investment, estimated as capital expenditures over total assets (Lioui and Sharma 2012), which should be positively associated with better economic performance, when part of a long-term view.

Table 3. Correlation matrix.

Variables		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
ROA	(1)	1.000												
Net Profit Margin	(2)	0.198 *	1.000											
Asset Turnover	(3)	0.376 *	−0.219 *	1.000										
EVA Margin	(4)	0.266 *	0.203 *	0.185 *	1.000									
ESG Score	(5)	−0.090 *	−0.038 *	−0.044 *	0.062 *	1.000								
Environmental	(6)	−0.120 *	0.014	−0.071 *	0.088 *	0.845 *	1.000							
Social	(7)	−0.123 *	−0.049 *	−0.058 *	0.038	0.883 *	0.701 *	1.000						
Governance	(8)	−0.006	−0.050 *	0.016	0.022	0.663 *	0.331 *	0.365 *	1.000					
Leverage	(9)	−0.190 *	0.110 *	−0.352 *	0.004	0.095 *	0.094 *	0.078 *	0.058 *	1.000				
Size	(10)	−0.311 *	−0.030	−0.264 *	0.025	0.531 *	0.554 *	0.464 *	0.275 *	0.243 *	1.000			
CAPEX	(11)	0.069 *	−0.098 *	0.280 *	0.069 *	0.010	−0.017	0.007	0.037	−0.254 *	−0.043 *	1.000		
R&D	(12)	−0.076 *	−0.401 *	−0.099 *	−0.786 *	−0.021	−0.106 *	0.001	0.042 *	−0.111 *	−0.104 *	−0.010	1.000	
Growth	(13)	0.014	0.031	−0.005	−0.033	−0.101 *	−0.107 *	−0.082 *	−0.058 *	−0.030	−0.078 *	0.001	0.027	1.000

Note: * represent a significance level at 10%.

Overall, there is a statistically significant correlation between the independent variables. A variance inflation test (VIF) was performed. The absence of values above the 2.0 threshold confirms the absence of multicollinearity.

4. Econometric Results

4.1. Results and Discussion

Table 4 reports the main econometric results from the pooled ordinary least squares method (OLS). The ESG score is taken as the independent variable, and both main metrics of economic performance, namely ROA and EVA margin, are included. Robust standard errors for heteroskedasticity, industry and year effects, and firm-specific control variables are specified in all the estimations. The need to control for industry effects is driven by the industry-specific benefits of considering sustainability matters (Ding et al. 2016; Ashraf et al. 2019). The results are robust in their support of a positive association between a firm's ESG score and their economic performance at conventional significance levels. The results in column (1) are aligned with those of Fischer and Sawczyn (2013), and Dalal and Thaker (2019), implying that firms are rewarded in the overall firm-level performance, as a consequence of higher standards of socially responsible behavior.

Moving to column (2), our analysis bolsters the argument that increased ESG performance is significantly associated with greater economic profits. In these estimations, economic performance is captured by the return on invested capital exceeding the cost of financing the capital employed in the business. The association is positive and significant, although it diverges from the scarce literature employing economic value added in the research approach (Mittal et al. 2008). These results support the evidence in the existing literature that planning and acting responsibly do not necessarily involve capital and resource redirection (Allouche and Laroche 2005). Instead, better sustainability performance can yield competitiveness and reduce downside risks, through effective and sustainable capital allocation, in the long run. In our base estimation, the findings clearly show that no notable differences stem from the measure of economic performance employed. Collectively, these results suggest that reshaping corporate strategy and brand positioning by incorporating a robust sustainable proposition may allow firms to build competitive advantage and, consequently, drive economic performance.

The remaining columns in Table 4 detail the relationship between economic performance and each ESG pillar, environmental, social, and governance. As expected, the results present a similar picture, with positive and significant coefficients at conventional levels, albeit with lower magnitudes compared to the inclusive ESG score. While each pillar is statistically significant, the governance score has a greater magnitude in its association with economic performance.

The governance score marginally outperformed in all the subsequent models, implying that social and environmental performance scores may be more sensitive to distinct features. The results differ from the prior literature (Cek and Eyupoglu 2020; Yawika and Handayani 2019), where the heterogeneity of the outcomes precludes consensus on the relevance of each individual dimension. However, the environmental and social scores capture different dynamics than the governance score. The literature had suggested a greater spillover effect from each one to the other (Barros et al. 2022), which is also captured by the very high correlation between these two pillars (0.701).

Table 4. OLS regressions: main proxies for economic performance.

Variables	ROA	EVA Margin	ROA	EVA Margin	ROA	EVA Margin	ROA	EVA Margin
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ESG Score	0.0744 ***	0.0826 ***						
	(0.0168)	(0.0243)						
Environmental			0.0372 ***	0.0298 *				
			(0.0080)	(0.0180)				
Social					0.0156 **	0.0385 **		
					(0.0072)	(0.0186)		
Governance							0.0538 ***	0.0673 ***
							(0.0173)	(0.0167)
Leverage	−0.1067 ***	−0.0324	−0.1054 ***	−0.0302	−0.1077 ***	−0.0315	−0.1107 ***	−0.0394
	(0.0164)	(0.0296)	(0.0163)	(0.0296)	(0.0167)	(0.0298)	(0.0171)	(0.0299)
Size	−0.0285 ***	−0.0138 ***	−0.0269 ***	−0.0111 ***	−0.0246 ***	−0.0111 ***	−0.0258 ***	−0.0112 ***
	(0.0055)	(0.0028)	(0.0050)	(0.0028)	(0.0043)	(0.0025)	(0.0051)	(0.0025)
CAPEX	0.0220 ***	0.0498 **	0.0237 ***	0.0523 **	0.0236 ***	0.0514 **	0.0207 ***	0.0453 *
	(0.0073)	(0.0244)	(0.0075)	(0.0242)	(0.0075)	(0.0244)	(0.0070)	(0.0242)
R&D	−0.0983 ***	−1.0662 ***	−0.0952 ***	−1.0641 ***	−0.0975 ***	−1.0665 ***	−0.1013 ***	−1.0703 ***
	(0.0202)	(0.0613)	(0.0187)	(0.0626)	(0.0195)	(0.0620)	(0.0217)	(0.0602)
Growth	−0.0015	0.0206	−0.0020	0.0181	−0.0028 *	0.0175	−0.0023	0.0157
	(0.0015)	(0.0212)	(0.0014)	(0.0211)	(0.0016)	(0.0211)	(0.0016)	(0.0211)
Interception	0.7086 ***	0.3241 ***	0.6915 ***	0.2939 ***	0.6527 ***	0.2886 ***	0.6606 ***	0.2792 ***
	(0.1189)	(0.0605)	(0.1139)	(0.0629)	(0.1018)	(0.0585)	(0.1115)	(0.0588)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2761	1845	2761	1845	2761	1845	2761	1845
R-squared	0.1526	0.7048	0.1477	0.7032	0.1445	0.7034	0.1523	0.7054
Wald Test	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Additionally, robust standard errors are presented in parentheses. All variables are defined in Table 1.

Concerning firm-specific controls, with fewer exceptions, the regressors are statistically significant and, therefore, are substantial in explaining economic performance variability. Although not central to the scope of this study, the directions we expected were not confirmed. Firm *Size* and *R&D* margins consistently displayed negative coefficients. Nonetheless, these results are aligned with the work of Lioui and Sharma (2012), and Dalal and Thaker (2019), which support the two main arguments. Firstly, undertaking new investments in tangible assets yields economic benefits, although a firm's excessive financial burden may contribute to performance downgrading. Secondly, R&D expenditures are uncertain in terms of future benefits, which do not necessarily make these options value-driven strategies in the short run.

There is no single proxy for economic performance, and covering many possibilities largely eliminates the uncertainty about the validity of our findings. Table 5 presents the estimations on which spheres of economic performance provide better sensitivity and/or derive greater impact from a firm's socially responsible behavior. For this effect, the models are estimated based on an economic performance decomposition using net profit margin and asset turnover. These are two main ways to better sustainability performance. On the one hand, net profit margin mainly captures firms' cost-efficient ability to transform revenues into net profits. On the other hand, asset turnover covers the firms' efficiency in asset usage, which may be dissociated from the firms' ability to produce profits. The results in Table 5 suggest that firms' increased commitment and socially responsible awareness influence distinct, albeit complementary, layers of economic performance. Hence, considering the meaningful and positive coefficients from the ESG score and its components, an interesting and comprehensive assessment is provided on how higher levels of sustainable performance may translate into increased profit margins, without negatively impacting cost-benefit trade-offs. However, support for the social score in column (5) raises the question of whether an investment in this component benefits the bottom line economic performance.

Table 5. OLS regressions: channels of economic performance.

Variables	Net Profit Margin	Asset Turnover	Net Profit Margin	Asset Turnover	Net Profit Margin	Asset Turnover	Net Profit Margin	Asset Turnover
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
ESG Score	0.0929 **	0.3231***						
	(0.0378)	(0.0530)						
Environmental			0.0689 **	0.1474 ***				
			(0.0294)	(0.0422)				
Social					0.0343	0.1747 ***		
					(0.0273)	(0.0412)		
Governance							0.0627 ***	0.2042 ***
							(0.0211)	(0.0402)
Leverage	−0.1792 ***	−0.6847 ***	−0.1759 ***	−0.6804 ***	−0.1799 ***	−0.6849 ***	−0.1840 ***	−0.7009 ***
	(0.0388)	(0.0619)	(0.0388)	(0.0620)	(0.0389)	(0.0622)	(0.0391)	(0.0625)
Size	−0.0135 ***	−0.1033 ***	−0.0135 ***	−0.0948 ***	−0.0097 ***	−0.0939 ***	−0.0099 ***	−0.0902 ***
	(0.0036)	(0.0089)	(0.0037)	(0.0089)	(0.0031)	(0.0077)	(0.0028)	(0.0081)
CAPEX	−0.0515	0.4272 ***	−0.0493	0.4346 ***	−0.0497	0.4330 ***	−0.0529	0.4230 ***
	(0.0573)	(0.0901)	(0.0569)	(0.0904)	(0.0574)	(0.0892)	(0.0575)	(0.0892)
R&D	−0.8994 ***	−0.3026 ***	−0.8942 ***	−0.2897 ***	−0.8986 ***	−0.3009 ***	−0.9027 ***	−0.3132 ***
	(0.0949)	(0.1129)	(0.0970)	(0.1071)	(0.0954)	(0.1109)	(0.0939)	(0.1171)
Growth	0.0144	−0.0135	0.0144	−0.0161	0.0131	−0.0168	0.0133	−0.0175
	(0.0137)	(0.0104)	(0.0140)	(0.0109)	(0.0131)	(0.0115)	(0.0128)	(0.0134)
Interception	0.3451 ***	3.2514 ***	0.3571 ***	3.1562 ***	0.2910 ***	3.1216 ***	0.2832 ***	3.0299 ***
	(0.0704)	(0.1915)	(0.0743)	(0.1936)	(0.0671)	(0.1761)	(0.0650)	(0.1808)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2761	2761	2761	2761	2761	2761	2761	2761
R-squared	0.5519	0.3363	0.5519	0.3299	0.5508	0.3306	0.5517	0.3337
Wald Test	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: ** and *** indicate statistical significance at the 5% and 1% levels, respectively. Additionally, robust standard errors are presented in parentheses. All variables are defined in Table 1.

Collectively, these findings shed light on the need to address the awareness and demands of stakeholders, as well as changes in consumption patterns and expectations in a globally competitive environment. The findings strengthen the argument that corporate sustainability acts as a differentiator and innovation driver of value, enhancing both the legitimacy and the reputation of firms. Thus, due to the mediating effects, sustainable performance may drive results.

4.2. Robustness

The prior literature, albeit scarce and inconclusive, was mostly built on a least squares method (OLS). Considering the specific features of the panel data, the appropriateness of an OLS regression remains doubtful in the prior research (Dalal and Thaker 2019). To overcome the possible constraints of previous studies, panel data techniques have been applied to control for potentially correlated, unobserved, and time-invariant heterogeneity (Arellano 2003). The first robustness setting aims to understand whether unobserved firm-specific variables insignificantly correlate with the other firms in the analysis (Gerged et al. 2021), leading to fixed or random effects estimations (Lioui and Sharma 2012). The specification depends on the results from the Hausman test and, in this section, they are highlighted for each regression in the respective statistical results tables.

Using panel data methods, the econometric setting accounts for industry–year effects and/or specifications, which have several motives: (i) to accommodate each economic sector's idiosyncrasies required the social behavior and degree of regulation, which consequently influences a firm's economic performance and the effectiveness and adequacy of its sustainable policies and practices (Fischer and Sawczyn 2013), and (ii) to capture the correlation between the stages of the economic cycle, that is to say, the underlying macroeconomic outlook and the cyclicality of firm-level performance over the years (Gonçalves et al. 2020a). Regardless of the Hausman test instruction, an exception was carefully considered because of the prior economic rationale discussed on the introduction of economic value added as the dependent variable. In the past decade, the accommodative monetary policy and increased fiscal stimulus from central banks have led to minimum risk-free interest rates. Thus, reduced financing costs and wider return spreads drive the need for additional bias controls when economic performance is measured through economic value added. Therefore, we decided to specifically define the year and industry fixed controls in Table 6, while controlling for random effects that are more suited to capturing the heterogeneities of firms (Lioui and Sharma 2012). These results strengthen the consistency and robustness of the primary analysis, and reinforce the positive association between firms' sustainability and economic performance.

Table 6. Fixed and random effects specifications: main proxies for economic performance.

Variables	ROA	EVA Margin	ROA	EVA Margin	ROA	EVA Margin	ROA	EVA Margin
	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
ESG Score	0.0476 ***	0.0859 ***						
	(0.0096)	(0.0291)						
Environmental			0.0299 ***	0.0882 ***				
			(0.0085)	(0.0227)				
Social					0.0364 ***	0.0218		
					(0.0070)	(0.0220)		
Governance							0.0067	0.0277
							(0.0062)	(0.0175)
Leverage	−0.0729 ***	−0.1248 ***	−0.0731 ***	−0.1208 ***	−0.0718 ***	−0.1270 ***	−0.0754 ***	−0.1284 ***
	(0.0111)	(0.0294)	(0.0111)	(0.0294)	(0.0111)	(0.0295)	(0.0116)	(0.0294)
Size	−0.0226 ***	−0.0266 ***	−0.0203 ***	−0.0286 ***	−0.0221 ***	−0.0223 ***	−0.0154 ***	−0.0217 ***
	(0.0024)	(0.0049)	(0.0023)	(0.0049)	(0.0023)	(0.0048)	(0.0027)	(0.0045)
CAPEX	0.0033	0.0353 *	0.0035	0.0368 **	0.0045	0.0365 **	0.0024	0.0352 *
	(0.0070)	(0.0183)	(0.0070)	(0.0182)	(0.0070)	(0.0183)	(0.0073)	(0.0183)
R&D	−0.0947 ***	−1.1665 ***	−0.0932 ***	−1.1640 ***	−0.0939 ***	−1.1671 ***	−0.1147 ***	−1.1677 ***
	(0.0105)	(0.0187)	(0.0105)	(0.0188)	(0.0105)	(0.0188)	(0.0141)	(0.0187)

Table 6. *Cont.*

Variables	ROA	EVA Margin	ROA	EVA Margin	ROA	EVA Margin	ROA	EVA Margin
	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Revenue	0.0026 *	0.0266 ***	0.0025 *	0.0280 ***	0.0024 *	0.0251 ***	0.0022	0.0249 ***
	(0.0014)	(0.0089)	(0.0014)	(0.0089)	(0.0014)	(0.0089)	(0.0014)	(0.0089)
Interception	0.5763 ***	0.6345 ***	0.5339 ***	0.6787 ***	0.5689 ***	0.5746 ***	0.4414 ***	0.5585 ***
	(0.0519)	(0.1054)	(0.0506)	(0.1066)	(0.0510)	(0.1046)	(0.0600)	(0.1015)
Fixed Effects	No	No	No	No	No	No	Yes	No
Random Effects	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Year	No	No	No	Yes	No	Yes	No	Yes
Industry	No	No	No	Yes	No	Yes	No	Yes
Observations	2761	1845	2761	1845	2761	1845	2761	1845
Wald Test	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Number ID	399	390	399	390	399	390	399	390

Note: *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Additionally, robust standard errors are presented in parentheses. All variables are defined in Table 1.

Furthermore, it should be observed that the adjustments performed in Table 6 are analogous to those in the equations presented in Table 5, following the same rationale. Nevertheless, when re-estimating these models in a panel data specification, it is noted straightaway that the association between a firm's level of governance and economic performance is reported as insignificant (columns 23 and 24). Nevertheless, these findings were likely, given that the construction of the sample comprised only listed and large capitalized firms in Europe. This option ensures that there are no significant time-variant heterogeneities in this context. Additionally, individual environmental and social performance scores retained the consistency of a statistically significant and positive impact on firms' economic performance, albeit at lower magnitudes.

Regarding the association between the different components of economic performance, by incorporating into the scope of this research the decomposition of the return on assets and the firm's overall ESG score as an incremental analysis, the preceding adaptations also apply to net profit margin and asset turnover as dependent variables. Overall, the ESG score remains statistically positive for these alternative proxies of economic performance (Table 7). The results of disentangling the ESG score into its pillars yields similar results and are not presented here for reasons of parsimony.

Next, we explore the potential endogeneity that may have driven the consistency and validity of prior results. Here, we followed the work of Gerged et al. (2021) and Nuskiya et al. (2021) and adopted a dynamic panel data specification. A two-step system generalized method of moments (GMM) estimator was conducted to confirm that previous outcomes were not significantly influenced by endogeneity and reverse causality concerns (Arellano and Bond 1991; Blundell and Bond 1998). Therefore, the methodology delivers an internal metamorphosis of the data, where the lagged variable is subtracted from its present value, thus improving the efficiency of the GMM estimator. In addition, the two-step system approach is considered to limit unnecessary data loss and increase the coefficients estimation consistency. Since the ROA has been the primary measure of economic performance employed in the prior literature, the system GMM is adopted in Table 8 specifically for ROA, and the Hansen and Arellano–Bond figures are examined to evaluate whether the instruments are correctly specified to confirm the soundness of the dynamic GMM estimator (Ullah et al. 2018). The estimations only denote one lagged economic performance variable, resulting in a non-statistically significant auto-regressive coefficient of order 2. As expected, the models in Table 8 further underpin a meaningful association between a firm's sustainability and its economic performance.

Table 7. Fixed and random effects specifications: channels of economic performance.

Variables	Net Profit Margin	Asset Turnover
	(25)	(26)
ESG Score	0.1722 ***	0.0823 **
	(0.0584)	(0.0351)
Leverage	−0.3874 ***	−0.2676 ***
	(0.0667)	(0.0401)
Size	0.0370 **	−0.2589 ***
	(0.0170)	(0.0103)
CAPEX	−0.0608	0.0762 ***
	(0.0419)	(0.0252)
R&D	−1.0300 ***	−0.1801 ***
	(0.0806)	(0.0485)
Revenue	0.0000	0.0079
	(0.0081)	(0.0049)
Interception	−0.6899 *	6.7193 ***
	(0.3706)	(0.2229)
Fixed Effects	Yes	Yes
Random Effects	No	No
Observations	2761	2761
R-squared	0.5519	0.3363
Wald Test	0.000	0.000
Number ID	399	399

Note: *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Additionally, robust standard errors are presented in parentheses. All variables are defined in Table 1.

Table 8. Two-step system GMM regression for ROA.

Variables	ROA	ROA	ROA	ROA
	(27)	(28)	(29)	(30)
ROA Lagged	0.7012 ***	0.6835 ***	0.8877 ***	0.6948 ***
	(0.0641)	(0.0640)	(0.0386)	(0.0606)
ESG Score	0.0180 ***			
	(0.0056)			
Environmental Score		0.0115 ***		
		(0.0042)		
Social Score			0.0064 **	
			(0.0029)	
Governance Score				0.0041
				(0.0034)
Leverage	−0.0318 ***	−0.0329 ***	−0.0149 ***	−0.0315 ***
	(0.0083)	(0.0083)	(0.0047)	(0.0084)
Size	−0.0057 ***	−0.0058 ***	−0.0024 ***	−0.0049 ***
	(0.0011)	(0.0011)	(0.0005)	(0.0010)
CAPEX	0.0073	0.0093 **	0.0054	0.0107 **
	(0.0051)	(0.0044)	(0.0048)	(0.0048)
R&D	−0.0223	−0.0257 *	−0.0156 *	−0.0213
	(0.0174)	(0.0153)	(0.0094)	(0.0151)
Growth	0.0148	0.0130	0.0117	0.0124
	(0.0112)	(0.0103)	(0.0097)	(0.0085)
Interception	0.1431 ***	0.1537 ***	0.0567 ***	0.1372 ***
	(0.0294)	(0.0289)	(0.0138)	(0.0274)
Year	Yes	Yes	Yes	Yes
Hansen Test	0.182	0.268	0.194	0.215
Arellano–Bond AR(1)	0.012	0.015	0.006	0.013
Arellano–Bond AR(2)	0.105	0.109	0.097	0.109
Observations	2357	2357	2357	2357
Number ID	385	385	385	385
Wald Test	0.000	0.000	0.000	0.000

Note: *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Additionally, robust standard errors are presented in parentheses. All variables are defined in Table 1.

Following Gonçalves et al. (2021b), a final supplementary analysis was conducted to overcome potential distortions concerning time-window biases. Firstly, we included the increasing demand and popularity of "going sustainable" and, also, the broader media coverage of associated scandals at the enterprise level after 2015. Secondly, we considered that economic value added regressions only contain observations from 2015 onwards, due to the unavailability of data. In this sense, the OLS regressions are re-estimated in Table 9 with a dummy variable accounting for 2015. The results again corroborate the significance level and positive impact denoted in previous results.

Table 9. OLS regressions: robustness analysis for 2015.

Variables	Return on Assets (1)	Net Profit Margin (2)	Asset Turnover (3)	Return on Assets (4)	Return on Assets (5)	Return on Assets (6)
Year 2015	0.0023	0.0623 ***	−0.0582 *	0.0039	0.0034	0.0038
	(0.0087)	(0.0233)	(0.0342)	(0.0088)	(0.0089)	(0.0088)
ESG Score	0.0744 ***	0.0929 **	0.3231 ***			
	(0.0168)	(0.0378)	(0.0530)			
Environmental				0.0372 ***		
				(0.0080)		
Social					0.0156 **	
					(0.0072)	
Governance						0.0538 ***
						(0.0173)
Leverage	−0.1067 ***	−0.1792 ***	−0.6847 ***	−0.1054 ***	−0.1077 ***	−0.1107 ***
	(0.0164)	(0.0388)	(0.0619)	(0.0163)	(0.0167)	(0.0171)
Size	−0.0285 ***	−0.0135 ***	−0.1033 ***	−0.0269 ***	−0.0246 ***	−0.0258 ***
	(0.0055)	(0.0036)	(0.0089)	(0.0050)	(0.0043)	(0.0051)
CAPEX	0.0220 ***	−0.0515	0.4272 ***	0.0237 ***	0.0236 ***	0.0207 ***
	(0.0073)	(0.0573)	(0.0901)	(0.0075)	(0.0075)	(0.0070)
R&D	−0.0983 ***	−0.8994 ***	−0.3026 ***	−0.0952 ***	−0.0975 ***	−0.1013 ***
	(0.0202)	(0.0949)	(0.1129)	(0.0187)	(0.0195)	(0.0217)
Growth	−0.0015	0.0144	−0.0135	−0.0020	−0.0028 *	−0.0023
	(0.0015)	(0.0137)	(0.0104)	(0.0014)	(0.0016)	(0.0016)
Interception	0.7086 ***	0.3451 ***	3.2514 ***	0.6915 ***	0.6527 ***	0.6606 ***
	(0.1189)	(0.0704)	(0.1915)	(0.1139)	(0.1018)	(0.1115)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2761	2761	2761	2761	2761	2761
R-squared	0.1526	0.5519	0.3363	0.1477	0.1445	0.1523
Wald Test	0.000	0.000	0.000	0.000	0.000	0.000

Note: *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Additionally, robust standard errors are presented in parentheses. All variables are defined in Table 1.

5. Conclusions

This study assesses the association between a firm's sustainability and its economic performance in Europe, and seeks to determine the magnitude and differential effects of individual sustainability dimensions in the ESG universe (environmental, social, and governance). The analysis aims to investigate the influence and channeling of corporate sustainability, while accounting for different layers of economic activity.

Drawing on stakeholder and legitimacy theory, the results of this study further strengthen the statistically significant and positive association between firms' socially responsible behavior and their economic performance. In line with Fischer and Sawczyn (2013), Dalal and Thaker (2019), and Ferrero-Ferrero et al. (2016), this study shows that firms are rewarded with better competitive advantages as a result of addressing stakeholder needs and demands for sustainability practices in a global, competitive environment. Moreover, these findings reinforce the fact that, owing to the narrative shift from following a conventional business model perspective to incorporating a core sustainable proposi-

tion and agenda, improving ESG dimensions drives economic results, albeit at a lower magnitude and with weaker evidence on corporate governance.

Collectively, the results demonstrate that planning and acting responsibly are undoubtedly first-order business priorities and that they are not a waste of capital and resources. In contrast, corporate sustainability translates into higher profit margins without negatively impacting cost-benefit trade-offs. Thus, our results suggest that increased corporate sustainability standards drive complementary dimensions of economic performance, primarily due to the mediating effects of both reputation and legitimacy, as well as enhanced differentiation and innovation. Overall, the environmental pillar is the one that is systematically associated with better economic performance across all estimations. The influence of sustainability performance on economic performance is also channeled by both profit margin and turnover. We find that a 1% improvement in the ESG score yields an increase in the economic value added of 0.08%, EVA over revenues.

Our findings carry implications for the extant literature because they offer greater clarification on the topic. We contribute to closing the gap in the literature, which has yet to reach a consensus (Dalal and Thaker 2019; Fischer and Sawczyn 2013; Lioui and Sharma 2012). Our conclusions are drawn from a recent and innovative analysis, using an endogenous sample composed of listed and large capitalized firms, in a European context. Going beyond a traditional financial perspective and in contradistinction to the evidence presented by Lioui and Sharma (2012), this study reinforces previous findings concerning a statistically positive relationship between sustainability and economic performance (Dalal and Thaker 2019; Ferrero-Ferrero et al. 2016; Fischer and Sawczyn 2013).

The results from this study are robust and consistent for alternative measures of economic performance, numerous econometric specifications, and overall and relative dimensions of corporate sustainability. To the best of our knowledge, this paper is the first to introduce both economic value added and ESG scores into the same framework to provide an innovative value-added perspective. Our study is also a precursor in comprehensively examining the influence and extent of corporate sustainability, while considering different components of economic performance.

A plethora of robustness tests support the view that sustainability drives economic performance. These robustness analyses include applying panel data methods and following comprehensive econometric settings. Firstly, we employed fixed and random effects regressors to control potentially correlated, unobserved, and time-invariant heterogeneity (Arellano 2003). Secondly, these findings are unchangeable, resulting from both potential endogeneity concerns and reverse causality biases, according to Arellano and Bond (1991), following a two-step dynamic GMM model (Nuskiya et al. 2021; Gerged et al. 2021). Lastly, intending to overcome selection biases, our findings are still congruous and stable by controlling for time-window biases, when the momentum and popularity of "going sustainable" reached new levels after 2015 (Gonçalves et al. 2021b).

From a managerial point of view, our results suggest that investing in sustainability yields non-negligible economic benefits. Our results reveal that sustainability is not a cost-driven strategy and should be reinforced by the pressure placed on firms to attain sustainability targets starting in 2022 (European Commission 2021). The required KPIs on turnover, CAPEX, and OPEX, as earmarked in the taxonomy of the proposed directive, are expected to lead to further investment in sustainability matters and, therefore, the benefits of economic performance are likely to be reshaped. Taking the lead on these initiatives is consistent with our main findings.

The following issues may offer suitable research avenues. Researchers could employ additional measures of economic performance that some papers have timidly addressed, such as risk-adjusted annual returns grounded on a solid or semi-strong market efficiency theory (Al-Tuwaijri et al. 2004). Scholars could explore topics that were beyond the scope of this paper, for example, developing a research design in the context of mergers and acquisitions, giving consideration to the crossing of effects of sustainability in these deals (Wang et al. 2021; Barros et al. 2022), and using different methods to capture a firm's sustainable

performance (Gonçalves et al. 2020b). Considering that the focus of this research was the largest capitalized and listed firms in Europe, it is acknowledged that this methodology should be extended to different geographies and non-listed firms. The recent developments worldwide following the pandemic period and the ongoing war in Eastern Europe, coupled with value chain constraints and inflationary pressures, altogether, comprise a constrained economic time that may shape how firms adopt sustainability strategies (Barnett et al. 2015). Further research may well look at this uncertain period.

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