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DISSERTATION

SUSTAINABLE AND ECONOMIC PERFORMANCE IN EUROPE

DIOGO MANUEL ALVES LOURO

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SUPERVISION:
PROFESSOR ALCINO TIAGO CRUZ GONÇALVES

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ABSTRACT

This thesis aims to evaluate the association between firms sustainable and economic performance in Europe, for companies listed in the STOXX Europe 600 Index from 2012 to 2020. For this effect, both combined and individual ESG (Environmental, Social and Governance) scores from Thomson Reuters Refinitiv serve as proxy for firm's corporate sustainability, whereas several dependent variables are included in order to capture the comprehensiveness of economic performance. Furthermore, the methodology employed comprises different panel data specifications to augment the validity and robustness of results, in depth, to overcome potentially unobserved, time-invariant heterogeneity, as well as endogeneity concerns and reverse causality biases. For this reason, apart from an ordinary least squares (OLS) model, both fixed and random effects regressions are applied throughout this research. In addition, a two-step GMM estimator is carried to account for possible distortions in prior results. The findings from this study strengthen a statistically significant and positive association between firms sustainable and economic performance in Europe. Thus, reinforcing that firms with higher and consistent standards of socially responsive behaviour are prone to build competitive advantages and consequently drive economic results. Although, on an individual level, and albeit overall lower magnitudes, weaker evidence was reported in regard to corporate governance.

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GLOSSARY

ESG – Environmental, Social and Governance

CSR – Corporate Social Responsibility

Euro Stoxx 600 Index – STOXX Europe 600 Index

EVA – Economic Value Added

ROA – Return on Assets

NOPAT – Net Operating Profit After Taxes

ROIC – Return on Invested Capital

WACC – Weighted Average Cost of Capital

1. INTRODUCTION

Sustainability has become an unmatched priority and urgency across the globe. The concept is comprehensive and perceived as a multidimensional construct. A recent shift in paradigm was decisive for the milestones achieved so far, and both the 2050 Paris Agreement and the 2030 UN Agenda for Sustainable Development were the most recent calls for action. Furthermore, this new narrative emerged across the business sector, as one of the most prominent themes of the 21st century, driven by stakeholders increasingly demands over enterprise legitimacy and socially responsible behaviour. Thus, the latest trend on corporate action is the acronym ESG (Environmental, Social and Governance), the three central non-financial factors, in measuring corporate sustainability and societal impact, already ingrained in the business community, media, policy makers and academic sphere (Matos, Barros & Sarmento, 2020; Gonçalves, Gaio & Ferro, 2021).

The debate over sustainable performance has shifted from a more traditional financial perspective towards a more refined outlook of socio-economic outcomes (Wang, Tong, Takeuchi & George, 2016). Although, the empirical evidence on the association between sustainable and economic performance remains scarce and unclear at the present day. The absence of moderating effects (McWilliams & Siegel, 2000; Ferrero-Ferrero, Fernández-Izquierdo & Muñoz-Torres, 2016), the causality of the well-known argument "doing well by doing good" (Matos, 2020), and the comprehensive nature of economic performance are frequently arguments to justify the heterogeneity of results. Nevertheless, a positive and statistically significant pattern is denoted in preceding literature, often in light of both Freeman (1984) and Jones (1995) framework, advocates of stakeholder theory.

Therefore, aiming to comprehend whether and how firm's sustainable and economic performance are interrelated, considering a Pan-European context, this thesis was carried undertaking data from Thomson Reuters Refinitiv, more in depth, a sample consisting of 399 firms currently listed on the Euro Stoxx 600 Index, encompassing 9 industry sectors and 17 countries in the European Union, resulting in 2,761 firm-year observations.

Furthermore, to present the multidimensionality of corporate sustainability, this study employs both the combined and individual ESG (Environmental, Social and Governance) scores from Refinitiv as independent variables, whereas several metrics are considered to

capture the comprehensiveness of economic performance. Also, a supplementary analysis is performed to evaluate the influence and channelling of firm's sustainable performance, when considering distinct, even so, complementary layers of economic activity.

Results from this study strengthen a statistically significant and positive relationship between firm's sustainable and economic performance. Thus, in agreement with those of Fischer and Sawczyn (2013), Dalal and Thaker (2019) and Ferrero-Ferrero et al. (2016), this thesis bolsters the argument that increased standards of socially responsive behaviour, strategically, drives economic results. Hence, and alternatively to the view that corporate sustainability presupposes the detour of assets and resources (Allouche & Laroche, 2005), the evidence further suggests that planning and acting responsibly enhances the effective and sustainable allocation of capital in the long run.

Furthermore, the contribution from the additional analysis in this study, shed light to the notion that by integrating a strong sustainable preposition, firms are rewarded in terms of bottom-line profit margins without negatively impact cost-benefit trade-offs. Hence, implying that firms are prone to build competitive advantages and consequently enhance economic performance, primarily as a result of mediating effects. For instance, enhanced differentiation and innovation, legitimacy, and brand reputation, aligned with changes in consumption patterns and expectations, increased policies, and degree of regulation.

Finally, this research offers significant contribution to prior literature and insightful remarks, offering managers and policy makers practical implications. First, contributes to tighten the gap in the literature, which at the moment, remains scarce and unclear (Dalal & Thaker 2019; Fischer & Sawczyn, 2013; Lioui & Sharma, 2012), by providing a recent analysis in the scope of research, considering an endogenous sample, composed of listed and large capitalized firms, on a Pan-European context.

Secondly, beyond a traditional financial perspective and conversely to the evidence presented in Lioui and Sharma (2012), this thesis reinforces previous findings in regard to a statistically and positive relationship between sustainable and economic performance, in agreement with the following authors, Dalal and Thaker (2019), Ferrero-Ferrero et al. (2016) and Fischer and Sawczyn (2013).

Thirdly, 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, although, albeit lower magnitudes and considering weaker evidence regarding corporate governance.

Fourthly, and to the best of our knowledge, this research is the first to introduce both economic value added and the ESG scores into the knowledge domain, aiming to provide an innovative value-added perspective, as well as an up-to date and consensual substance regarding sustainable performance.

Fifthly, and as far as we are aware, is the first study to comprehensively examine the influence and extent of corporate sustainability, while considering different components of economic performance, namely both bottom-line net profit margins and asset turnover, through the decomposition of return on assets, accordingly to the model of Dupont.

Finally, the results from this study are still valid and robust, when applying panel data methods and following comprehensive econometric settings. First, employing fixed and random effects regressors, which aim to control potentially correlated, unobserved, time-invariant heterogeneity (Arellano, 2003). Secondly, these findings are also unchangeable, accounting for potential distortions, resulting from both endogeneity concerns and reverse causality biases, in view of Arellano and Bond (1991). Thus, by implementing a two-step dynamic generalized method of moments (GMM), following the authors (Nuskiya et al. (2021); Gerged, Beddewela & Cowton, 2021). Lastly, aiming to leave no room for further doubts, and accordingly to Gonçalves, Pimentel and Gaio (2021), these findings are still congruous and stable when controlling for time-window biases, when the momentum and popularity of "going sustainable" reached new levels after 2015.

This paper proceeds as follow. The literature review is presented under section 2, and section 3 describes the sample and research methodology. Section 4 comprehends results and discussion, while section 5 reports conclusions and contributions, as well as further avenues and limitations of this study.

2. LITERATURE REVIEW AND HYPOTHESES

Sustainability has become an unmatched priority and urgency across the globe. The concept is comprehensive and perceived as a multidimensional construct. There are no universally accepted definitions, although the World Business Council for Sustainable Development adopted the interpretation of the Norwegian Prime Minister Gro Harlem Brundtland: *"Meeting the needs of the present without compromising the ability of future generations to meet their own needs"* (Porter & Kramer, 2006, p.80). Furthermore, a recent shift in paradigm was decisive for the milestones achieved so far, and both the 2050 Paris Agreement and the 2030 Agenda for Sustainable Development were the most recent calls for action. The ambitious effort to reduce global warming and achieve net zero emissions was set by the EU Paris Agreement, while the United Nations Member States defined seventeen Sustainable Development Goals (SDGs), with the purpose of fighting poverty, improving health and education, reducing inequality and spur economic growth, while facing climate changes and environmental preservation.

2.1. Theoretical Framework

Corporate sustainability emerged as one of the most prominent themes of the 21st century (Ng & Rezaee, 2015). Although, complementary and overlapping theories have been discussed in the literature for decades. Triple Bottom Line (Elkington, 1994), Corporate Social Performance and Corporate Social Responsibility (Bowen, 1953), among others, have gained widespread acceptance in the academic sphere and business community throughout the years. McWilliams and Siegel (2001, p.117) defined CSR as: *"actions that appear to further some social good, beyond the interests of the firm and what is required by law".* Carroll (1991) distinguished it in four different categories, the business accomplishment of its economic, legal, ethical, and discretionary/philanthropic responsibilities (Carroll & Shabana, 2010). Further, the underlying arguments supporting the business case for CSR are extensively discussed in their work. For instance, according to Zadek (2000), firms pursue CSR strategies in order to strength their reputation, justify benefits over costs, integrate with their broader strategies and learn, innovate, and manage risk (Carroll & Shabana, 2010). In addition, the arguments posed by Kurucz, Colbert and Wheeler (2008) are based on cost and risk reduction, obtaining competitive advantages, enhancing reputation and legitimacy, and seeking win–win outcomes through synergistic value creation (Carroll & Shabana, 2010).

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The classical view in finance as long embraced the shareholder value maximization perspective (Liang & Renneboog, 2017). Hence, this paradigm is at the heart of Milton Friedman's doctrine: *"the business of business is business"* (Clarkson, 1995). Alongside with the backward view of capitalism that: *"business contributes to society by making a profit"* and thus *"conducting business as usual is sufficient social benefit"* (Porter & Kramer, 2019, p.326). Although, in past decades a new narrative emerged, the stakeholder theory, coined by Freeman (1984), embodies the principle that effectively managing the relationship with stakeholders, the ones that have, or claim, ownership, rights, or interests in a corporation and its activities, contributes to new sources of value and consequently firms long term success (Clarkson, 1995; Barnett & Salomon, 2012; Wallace, 2003). In accordance, Jones (1995) reinforces that stakeholder-oriented management can result in significant competitive advantages and enhance economic performance (Ferrero-Ferrero, Fernández-Izquierdo & Muñoz-Torres, 2016).

The demands and emphasis from stakeholders in regard to firms socially responsive consciousness and behaviour have been significantly increasing over the years (Tamimi and Sebastianelli (2017) in Sila & Cek, 2017). Thus, challenging the view that managers only need to be responsive for stockholders (Parmar, Freeman, Harrison, Wicks, Purnell & Cole, 2010). Therefore, in the light of the stakeholder theory, a large body of authors reinforced that firms build and preserve stakeholder value by integrating environmental, social, as well as governance factors into management (Ferrero-Ferrero et al., 2016). For instance, by providing better products and services, attracting, and retaining high quality employees, enhancing trust and reputation, gaining social legitimacy, increasing customer loyalty, and risk management, enhancing productivity, differentiation, and innovation, mitigating regulatory costs, and promoting first mover advantages (Ferrero-Ferrero et al., 2016; Frynas, 2015). Although, undertaking socially responsive efforts to effectively construct these firm/stakeholder relationships can also represent a large set of conflicting demands and considerable resource allocation with a limited budget (Barnett & Salomon, 2006). In addition, as pointed by Preston and Post (1975), Waddock and Graves (1997) and Wicks, Berman and Jones (1999), some of the relations are more instrumental for the success of business than others (Barnett & Salomon, 2006). Thus, Jensen (2001) proposed a new narrative, namely the enlightened value maximization theory, an extension of the

stakeholder theory framework that accepts as the criterion for making the required trade-offs among stakeholders, the maximization of the long run value of the firm.

Furthermore, other prevailing and complementary frameworks are established within the bounds of corporate social responsibility. The institutional theory supports that organizations in the same field tend to become homogenous through the adoption of common institutional practices and generally accepted social norms and beliefs (Fernando & Lawrence, 2014). The legitimacy theory holds that firms are constantly aiming to ensure that they are perceived as functioning within the bonds and norms of society (Deegan, 2009). De Villiers and van Stade (2006) argued that corporations will do whatever they consider necessary in order to secure their image of a legitimate business with legitimate aims and methods of achieving it. Furthermore, Berrone and Gomez-Mejia (2009, p.104) contend that: *"organizations enhance or protect their legitimacy (Scott, 1995) by conforming to the expectations of institutions and stakeholders (Aldrich & Fiol, 1994; DiMaggio & Powell, 1983)".* Thus, stakeholders' consciousness of a non-sustainable firm can threaten their legitimacy and consequently jeopardize its longevity (Hummel & Schlick, 2016). For this reason, companies face social and political pressures to preserve their rightfulness by complying with societal norms and sustainable standards (Guthriea and Parkerb (1989) in Ng & Rezaee, 2015).

The agency theory (Jensen and Meckling 1976; Ross, 1973) emerged as a dominant paradigm in the financial economics literature (Hill & Jones, 1992). Jensen and Meckling (1976) acknowledge that agency costs and conflicts of interest are inherent elements in any owner-manager relationship (Masulis & Reza, 2014). Thus, the agency theory posits a completely opposite perspective to corporate social responsibility advocates. Also, aligned with both managerial opportunism and the trade-off hypothesis, certain authors argue that corporate sustainability involves the detour of capital and resources (Allouche & Laroche, 2005), as well as sacrificing productive projects that could yield more over time (Schuler & Cording, 2006). Following, managers may overinvest in this spectrum for their own benefits and personal interests, aiming to enhance their reputation while shareholders incur an opportunity loss (Brown, Helland & Smith, 2006; Barnea & Rubin, 2010). Finally, the allocation of firm resources in a sustainable approach provides managers the ability to prevent negative attention and offset or legitimize poor financial

performance (Peng & Isa, 2020). Therefore, competitive disadvantages may arise when compared to less socially responsive corporations (Allouche & Laroche, 2005).

The legitimacy of business has been significantly deteriorating in the most recent history and caught in a vicious cycle (Porter & Kramer, 2019). Firms remain trapped in an outdated value creation approach, aiming to enhance financial performance in a bubble while ignoring the broader influences of their long-term success (Porter & Kramer, 2019). Therefore, Porter and Kramer (2019) emphasize how decisive is to have business and society connected and introduce the concept of shared value. The framework consists in the creation of both economic and societal value, and according to the authors has the power to drive both the next wave of innovation, and productivity growth in the global economy. More in depth, it intends to enhance competitiveness while simultaneously advancing economic and social conditions (Porter & Kramer, 2019). Although, it should be underlined that: *"shared value is not social responsibility, philanthropy, or even sustainability, but a new way to achieve economic success. It is not on the margin of what companies do but at the center"* (Porter & Kramer, 2019, p.324).

2.2. Empirical Evidence

In 2020, Larry Fink, the chairman and CEO of BlackRock, the world's largest fund manager, reinforced a commitment towards sustainability in its annual shareholders letter, entitled "fundamental reshaping of finance". The latest trend on corporate action emerged as the acronym ESG – Environmental, Social and Governance – the three central non-financial factors in measuring sustainability and firm's societal impact, already ingrained in the business and academic community, media, and policy makers (Matos et al., 2020). This approach has been developed by several organizations, including the UN Global Compact, Global Reporting Initiative (GRI) and UN Environment and Program Finance Initiative (UNEP FI) (Matos et al., 2020). Although, there is no exact consensus on the materiality and scope of each ESG constituent. Nevertheless, the environmental pillar includes the impact on climate change and carbon emissions, natural resource use and energy and water management, pollution and waste, eco-design, and innovation (Matos, 2020). The social pillar comprehends firm's workforce health and safety, diversity and training, customer and product responsibility, and community relations and charitable activities (Matos, 2020). At last, the corporate governance pillar incorporates shareholder

rights, composition of boards of directors, management compensation policy, fraud, and bribery (Matos, 2020).

The empirical research on the association between corporate sustainability, financial performance, and firm value, often referred as "doing well by doing good" (Matos, 2020), has been significantly increasing over the years. Although, when considering its intensive literature, on balance, few studies are published among the top ranked finance and economics journals (Matos, 2020). Nevertheless, one leading research on the Journal of Finance, regarding the work of Lins, Servaes and Tamayo (2017), denotes that social capital built through corporate social responsibility acts as an insurance policy in periods of crisis and uncertainty.

A meta-analysis study developed by Friede, Busch and Bassen (2015), documented that ninety percent of existing research evidences a non-negative relationship between sustainable and financial performance, and also denotes that most positive findings appear stable over time. Orlitzky, Schmidt and Rynes (2003), integrating 30 years of research across different industries and studies contexts, add certainty of a positive association between corporate social performance and financial performance, which according to the latter, tend to be simultaneous and bidirectional with reputation as an important mediator. Margolis, Elfenbein and Walsh (2007) identified a mixed set of effects and emphasized the complexity regarding the reality of this interrelation, although the authors stand for a moderately positive impact.

Fischer and Sawczyn (2013), based on the Global Reporting Initiative, revealed that satisfying growing stakeholder's requirements regarding transparency and firm's socially responsive behaviour, drives reputation and financial results. Also, better ESG provides less risk in terms of managerial opportunism (Gonçalves, Gaio & Ferro, 2021). Brogi and Lagasio (2019) focused on the industrial and financial sector, reported that ESG strengths enhances profitability and drives stakeholder value. Following a similar research design, both Dalal and Thaker (2019) and Velte (2017) strengthen previous findings. Gonçalves, Pimentel & Gaio (2021) show that risk adjusted returns for green investing are higher than their conventional peers. Alternatively, Lioui and Sharma (2012) identified that environmental corporate social responsibility negatively impacts firm's financial results,

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although, a positive indirect effect is noted as a consequence of increased research and development efforts which generate additional value.

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

Notwithstanding, overall, the empirical research regarding sustainable and financial performance yielded different findings over time. McWilliams and Siegel (2000) denoted that the heterogeneity of results in preceding literature is the outcome of flawed empirical analysis and suggested that econometric modelling misspecifications result in upwardly biased estimations. Furthermore, the authors found evidence of a neutral association, although it should be noted that instead of a liner dependence, some researchers advance the possibility of a U-shaped pattern (Taliento, Favino & Netti, 2019).

The debate over sustainable performance has shifted from a more traditional financial perspective towards a more refined outlook of socio-economic outcomes (Wang et al., 2016). In this sense, economic performance encompasses a more comprehensive nature, considering both financial and non-financial performance (Yawika & Handayani, 2019). As a result, recent studies have examined this dimension, by measuring firm's financial health as well as their ability to promote sustainable growth and consequently long-term shareholder value, through an economic performance indicator extracted from Thomson Reuters Refinitiv (Ferrero-Ferrero et al., 2016; Tarmuji, Maelah & Tarmuji, 2016; Cek and Eyupoglu, 2020; Sila and Cek, 2017). Ferrero-Ferrero et al. (2016) examined the effect of environmental, social and governance consistency on economic results. Using a panel data set for listed firms of the EU-15 during the period between 2002 and 2011, the authors advance that ESG strengths are positively associated with economic performance. Furthermore, firms with an interdimensional ESG consistency reported an overall greater effect, except for higher levels of performance, which is justified with the fact that firm's efforts to be leaders in one extra-financial category still yields strong results.

Following, Cek and Eyupoglu (2020), examined both the aggregated and individual dimensions of ESG performance and its relatedness with firm's economic performance in the US. For instance, the authors reported a statistically significant and positive effect when considering the overall score, albeit the evidence proved that on an individual level, only social and governance performance yields economic benefits. Sila and Cek (2017) introduced a similar research design in Australia and suggested that social performance consistently drives economic results, while environmental factors also have a statistically significant and positive effect, though to a lesser extent. Finally, Tarmuji et al. (2016) reinforced the heterogeneity of results by documenting that only governance and social dimensions appeared to be statistically significant and positive associated with economic performance in Malaysia and Singapore, respectively.

In contrast from prior literature, Yawika and Handayani (2019) focusing on the high-profile industry in Indonesia, evaluated the individual effects of each ESG constituent on firm's economic performance, considering both accounting and market-related measures. According to their study, environmental and social performance have not been considered by either companies or investors. Although, corporate governance exhibited contradictory results, only proving to have a negative effect from a market perspective. Nevertheless, it should be noted that due to weak correlations, the authors recommend the use of different proxies to classify economic performance in subsequent research.

Taliento et al. (2019) examined the evidence of corporate sustainability advantages in the period between 2014 and 2017 in Europe, also accounting for financial and market performance measures to comprehend economic results. The authors present interesting remarks, namely the fact that the individual ESG scores, on balance, are not impactful from an absolute level. Although, the excess or abnormal ESG performance, the distance from the industry average-normal figures is significant and positively relevant, shedding light to the notion of competitive advantages on a sustainability strategy.

Al-Tuwaijri, Christensen and Hughes (2004) investigated the interrelation between environmental performance and disclosure and economic performance. Alternatively, to past literature, to overcome the limitations of accounting and market-based measures, the authors elected the industry adjusted annual returns, aiming to represent a more objective and comprehensive measure of economic performance. Therefore, on this framework, the

authors advanced a positive and statistically significant association, consistent with the view that both are related with the quality of management, as well as investors preferences for equities of environmentally responsible firms.

Alsayegh, Rahman and Homayoun (2020), from a sample of Asian firms, reported a statistically meaningful and also positive relationship between environmental, social, and economic sustainable performance, thus signalling the interdependence between creating societal and economic value. Furthermore, the authors emphasize that ESG responsible firms may benefit from numerous competitive advantages, namely increased efficiency and competitiveness, improved reputation, and consumer trust, reduced financial risks and operating costs. El Ghoul, Guedhami and Kim (2017), considering a sample of 53 countries during the time window between 2003 and 2010, and controlling for firm-level unobservable heterogeneity, found evidence that the association between CSR and firm value is more meaningful in countries with weaker market institutions. These findings are derived from several channels, such as improved access to financing, greater investment, lower default risk, and higher future sales growth.

Blasi, Caporin and Fontini (2018) examined the relationship between corporate social responsibility and economic performance, by adopting seven macro categories, including environmental, community and governance, human rights, employee relations, diversity, and products. Also, considering accounting and market-based performance measures, as well as each firm's economic sector. The evidence supports that integrating corporate socially responsible behaviour, enhances total stock returns and reduces financial risks, although the results regarding accounting-based measures depend both on the specific area of investment and economic sector.

López-Arceiz, Bellostas and Rivera (2018) stated that the strength of the association between social and economic performance has a tendency to change accordingly to the measurement criteria of the latter. Hence, capturing economic performance is not free of challenges and previous evidence cements the argument of a multidimensional construct (Monevas and Ortas (2010) cited in López-Arceiz et al., 2018).

Finally, the empirical research carried by the following authors, differs from prior literature through the inclusion of value-added measures, namely Economic Value Added (EVA) and Market Valued Added (MVA), to comprehend firm's economic performance.

Therefore, Mittal, Sinha, and Singh (2018) examined whether having a code of ethics in firm's annual reports translates into better economic performance in India. Dewi (2013) in Indonesia and Strouhal et al. (2015) in Czech and Estonia, also assessed the influence of corporate social responsibility performance and disclosure on firm's economic results, although, on balance this stream of research does not support the interrelation of both, when considering a valued added approach.

Furthermore, Carini et al. (2017), relied on a representative sample of the intersection between two of the main three international indexes of CSR (Domini 400 Social Index, Dow Jones Sustainability World Index, FTSE4Good Index), intending to overcome the multiplicity of definitions and certifications, and documented that economic performance, primarily focusing on a market-based perspective, is affected by firms socially responsive behaviour. Thus, suggesting that firms with improved sustainable performance are more virtuous and consequently drive long term performance, where reputation seems to be the fundamental effect. Finally, the article published by Mishra (2020), in the Harvard law school forum on the topic of corporate governance, entitled "ESG Matters", suggests that ESG performance enhances economic value added, and consequently drives firm value.

This paper analyses the following research questions:

Research Question I: Considering that previous research yielded different findings over time, it remains unclear whether firm's strategic agenda on sustainable performance drives competitive advantages and consequently enhances economic results.

Research Question II: If there is an association between sustainable and economic performance and considering both as a multidimensional construct, in light of legitimacy and stakeholder theory, the question of whether firm's efforts are significant and equitable rewarded, irrespectively of each dimension of sustainability is perceived by stakeholders, remains doubtful.

As previously documented, the literature regarding the association between corporate sustainability and economic performance remains uncertain. The absence of moderating effects (McWilliams & Siegel, 2000; 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 frequently arguments to justify the heterogeneity of results. Although, the evidence is still scarce and ambiguous at the present day, growing

research has provided arguments of a statistically significant and positive relationship. Thus, consistently with both stakeholder and legitimacy theory frameworks, increasingly stakeholders' consciousness and demands regarding firms socially responsive behaviour, alongside with differentiation and reputational effects, may represent a strong preposition to enhance competitive advantages and consequently drive firms' economic performance. Hence, the following hypothesis is expected:

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 rather inconclusive, or misleading given the concept studied as a single construct. Furthermore, and on an up-to-date context, there is no exact consensus on which of the three ESG dimensions, environmental, social or governance, advances a stronger contribute in regard to firm's economic performance. (Cek & Eyupoglu, 2020, Yawika & Handayani, 2019). Therefore, and after examining former research, the idiosyncrasy among regions and studies contexts, in depth, elements such as socio-cultural factors, countries legal origins and institutional settings, economic development, and both industry intensity and degree of regulation, might be at the centre of unconclusive and distinct results. For this reason, aiming to provide increased evidence and robustness into the knowledge domain, the subsequent hypotheses are advanced:

H2: There is a significant association between firm's social performance and economic performance.

H3: There is a significant association between firm's environmental performance and economic performance.

H4: There is a significant association between firm's governance performance and economic performance

3. SAMPLE AND METHODOLOGY

3.1. Sample Construction

The empirical research was built on data collected from Refinitiv, between the time period 2010-2020. The sample selection encompasses firms currently listed on the Euro Stoxx 600 Index, comprising large, mid, and also small capitalization companies from 17 countries of the European region. Aiming to guarantee the sample homogeneity, firms

within the financial sector and/or presenting negative equity figures, i.e., in financial distress, were removed on account of their industry-specific regulatory settings as well as economic condition, respectively (Gonçalves & Coelho, 2019). Moreover, consequence of unavailable ESG scores and/or the absence of data to estimate economic performance metrics and required control variables, were also further firms removed from the sample.

3.2. ESG Score

The database from Thomson Reuters (2021) provides comprehensive analytical data to classify firms ESG performance, commitment and effectiveness based upon verifiable reported data in the public domain. The underlying ESG data framework comprises more than 450 company-level ESG metrics for more than 10 000 companies around the world. A percentile rank methodology is carried employing 186 comparable measures, grouped in the following 10 categories: resource use, emissions, and innovations (environmental); workforce, human rights, community, and product responsibility (social); management, shareholders, and CSR strategy (governance). The scoring is built based on a relative sum of the category weights which vary across industries regarding environmental and social categories and country of incorporation peers concerning governance dimensions.

In addition, Refinitiv provides the ESG controversies score, which aims to discount the ESG performance by considering the impact of scandals and negative media covering, and the occurrence of further developments. Thus, negative events may still be reflected in the subsequent year's performance. Also, the score is set to control the bias of market capitalization derived from the wider media covering.

3.3. Economic Performance

Economic performance is constantly perceived as a multidimensional construct, and often, its measurement becomes ambiguous and also uneven along the literature. For this reason, on account of the comprehensiveness of multiple drivers of economic activity and following the stream of research presented by Taliento et al. (2019) and McWilliams and Siegel (2000), this study employed distinct, even so, complementary metrics of economic performance, to ease the challenges posed by its measurement and increase the soundness of results.

Return on assets (ROA), one of the core metrics in this study, the quotient between earnings after taxes and total assets, represents a comprehensive picture regarding firms

stable and continuous economic activity. In addition, through the decomposition of ROA, accordingly to the model of Dupont, it is possible to comprehend firms net profit margin (NPM), the ratio between income after taxes and revenues; and firms asset turnover (AT), representing revenues over total assets. Hence, resulting in firm's operational profitability and asset-use efficiency, respectively.

Economic value added (EVA), representative of firm's economic profits, is usually measured following two equivalent and commonly accepted approaches (Stewart, 2009). First, as the difference between net operating profit after taxes but before any interest expenditures (NOPAT) and a capital charge i.e., the weighted average cost of capital (WACC) times the capital employed (IC) in the business (as presented in equation 1). Secondly, under equation 2, as the percentage spread between return on invested capital (ROIC) and the weighted average cost of capital (WACC), multiplying by firms total invested capital (IC). Therefore, reflecting the risk-adjusted added-value from dynamic elements, namely profit growth, financing costs, capital resource allocation efficiency and economy of means (Stewart, 2009).

(1) $$EVA = \text{NOPAT} - \text{WACC} * IC$$

(2) $$EVA = (ROIC - WACC) * IC$$

The estimations of EVA are still subject of debate at the moment, more specifically regarding necessary adjustments identified by Stern and Stewart (1991), which aim to overcome accounting distortions with the purpose of revealing firm's economic results. Although, the arguments presented by Chari (2009) and applied by practitioners, stating that the nature and number of adjustments should be tailored to suit each specific firm; and introduced by Young (1999), that a large number of adjustments are immaterial and consequently not economically significant, offer a solid ground for the assumption of not considering any adjustments in the course of this research. Nevertheless, any estimation bias equally affects each individual firm, thus results are still validated and conclusive. Furthermore, to mitigate any potential limitations regarding the statistical properties of an income-based measure, this research employs EVA margin, the quotient between EVA and revenues, as dependent variable (Stewart, 2009). However, the results reported serve only as a complementary analysis and increased robustness, considering the unconclusive literature on the topic.

3.4. Methodology

Aiming to explore the research question I, two different models were estimated based upon multivariate regression analysis, intending to investigate any association between firm's sustainable and economic performance. For this reason, a frequently used and also up-to-date measure of corporate sustainability in the literature, the ESG score, serves as independent variable, whereas two distinct and comprehensive metrics are considered in order to capture firm's economic performance, namely the return on assets and economic value added, as presented under equation 1 and 2, respectively.

Thus, following prior research, Fischer and Sawczyn (2013) and Mittal et al. (2018), and controlling for firm-specific characteristics, as well as year and industry effects, both equations intend to examine *H1*:

(1) $ROA_{it} = \alpha_0 + \beta_1 ESG_{it} + \beta_2 Size_{it} + \beta_3 Lev_{it} + \beta_4 Growth_{it} + \beta_5 R\&D_{it} + \beta_6 Capex_{it} + \beta_7 Industry_i + \beta_8 Year_i + \varepsilon_{it}$

(2) $EVA_{it} = \alpha_0 + \beta_1 ESG_{it} + \beta_2 Size_{it} + \beta_3 Lev_{it} + \beta_4 Growth_{it} + \beta_5 R\&D_{it} + \beta_6 Capex_{it} + \beta_7 Industry_i + \beta_8 Year_i + \varepsilon_{it}$

Where *i* denotes each firm and *t* the corresponding year.

Furthermore, and analogous to the research question II and designated hypothesis, to comprehend the marginal effect of each ESG dimension on firm's economic performance, and whether their individual contribution is significative, the same specification presented under equation 1 and 2 is considered, although, replacing the overall ESG score by each individual sub-index scores, namely environmental, social and governance pillars. Thus, the prior base models are re-estimated under this setting to test the validity of *H2*, *H3* and *H4*.

Additionally, an in-depth analysis is advanced, with the purpose of understanding at which extent firms ESG performance impacts different layers of economic activity. For this reason, this study acknowledges that decomposing return on assets, in accordance with the model of Dupont, provides a multidimensional analysis on the scope of research. Hence, following the same rational of prior models, under equation 3 and 4, distinct, even so, complementary measures of economic performance are introduced, both the net profit

margin and asset turnover, which aim to reflect firm's operational profitability and asset-use efficiency, as previously denoted.

(3) $NPM_{it} = \alpha_0 + \beta_1 ESG_{it} + \beta_2 Size_{it} + \beta_3 Lev_{it} + \beta_4 Growth_{it} + \beta_5 R\&D_{it} + \beta_6 Capex_{it} + \beta_7 Industry_i + \beta_8 Year_i + \varepsilon_{it}$

(4) $AT_{it} = \alpha_0 + \beta_1 ESG_{it} + \beta_2 Size_{it} + \beta_3 Lev_{it} + \beta_4 Growth_{it} + \beta_5 R\&D_{it} + \beta_6 Capex_{it} + \beta_7 Industry_i + \beta_8 Year_i + \varepsilon_{it}$

Finally, attempting to comprehend both the magnitude and association between each component of firm's economic performance and the marginal effects from particular ESG sub-index scores, prior adaptations are also considered under equations 3 and 4. As such, the individual sub-index scores, namely the environmental, social and governance pillars, take place as independent variables, while specific metrics of economic performance are still considered accordingly to the decomposition of return on assets.

Firm-specific control variables are drawn from existing empirical evidence, namely the work from the authors, McWilliams & Siegel (2000), Taliento et al. (2019) and Lioui & Sharma (2012), and defined as follows:

Firm Size (*Size*): The natural logarithm of firm's total assets, in thousands of euros. Following prior literature, larger firms may benefit from economies of scale and scope, slack resources, and control over stakeholders (Taliento et al., 2019). Although, they are prone to be more exposed to publicity, pressure, and scrutiny, as well as to comply with increased governance practices and policies (Taliento et al., 2019, Carini et al., 2017). A positive association is expected between size and economic performance.

Leverage (*Lev*): The quotient between total debt and total assets. Highly levered firms are more favourable to incur in agency costs of debt and financial distress costs (El Ghoul et al., 2017). Also, firm's heavier financial burden may induce vulnerability (Alsayegh et al., 2020) and contribute to downgrade performance during uncertain times (Taliento et al., 2019). A negative association is anticipated, even though, there is an alert in regard to its complexity, i.e., a potentially U-shaped relationship.

Research and Development (*R&D*): The quotient between the R&D expenditures and revenues. McWilliams and Siegel (2000) underline the limitations of previous research as a result of misspecified models. Hence, the authors emphasize the intensity of R&D

investments as a significant determinant of performance and Carini et al. (2017) sustains its influence on economic growth in the medium-long run.

Remaining controls are defined as Revenue Growth (*Growth*), the percentual change in revenues year on year (El Ghoul et al., 2017; Ferrero-Ferrero et al., 2016), and a proxy of the investment ratio (*Capex*), estimated as capital expenditures over total assets (Lioui & Sharma, 2012). A positive association is predicted between both control variables and economic performance.

Appendix I. provides in-depth specifics and definitions of the previous and relevant variables introduced in this chapter.

4. ECONOMETRIC RESULTS

4.1. Descriptive Statistics & Correlation Matrix

The sample consists of 399 firms, belonging to 9 industry sectors and 17 countries in the European Union, resulting in 2,761 firm-year observations.

Table II summarizes the descriptive statistics of all variables within this sample. The average ESG Score is 0.64, consistent with the homogeneity between the individual ESG dimensions, environmental, social and governance. Although, on average, results are still lagging behind and firms still have a long way to go in order to reach fullness. 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 7.6% on a yearly basis. It should be noticed that due to unavailable data, economic valued added specifications contain fewer observations.

Appendix II introduces the Pearson Correlation matrix. As a preliminary result, an unpredicted negative and statistically significant correlation between the ESG score and economic performance is noted, with the exception of economic valued added. Inversely, the relatively high correlation between Size and ESG score, with a coefficient of (0.531), was expected based upon previous literature e.g., Taliento et al. (2019). Overall, there is a statistically significant correlation between independent variables. Variance Inflations Tests (VIF) were performed and the absence of values above 2.0 confirms the absence of multicollinearity (Neter, Wasserman & Kutner, 1985).

Table I. Descriptive Statistics

Variables	Observations	Mean	Standard Deviation	Minimum	Median	Maximum
Return on Assets	2761	.068	.12	-.275	.055	2.518
Net Profit margin	2761	.145	.363	-6.393	.087	4.154
Asset Turnover	2761	.733	.486	.019	.658	4.203
EVA margin	1845	.014	.257	-6.917	.031	.581
ESG Score	2761	.635	.184	.02	.667	.947
Environmental Score	2761	.626	.244	0	.675	.989
Social Score	2761	.671	.215	.012	.719	.982
Governance Score	2761	.579	.22	.038	.605	.979
Leverage	2761	.257	.145	0	.246	.811
Size	2761	23.014	1.433	17.653	22.93	26.932
Capex margin	2761	-.092	.174	-3.592	-.054	0
R&D margin	2761	.03	.172	-.037	0	6.105
Revenue Growth	2761	.076	.491	-.872	.045	22.164

4.2. Results and Discussion

Table II reports the main econometric results from the pooled ordinary least squares method (OLS). The ESG score is included as independent variable, as well as both metrics of economic performance, as previously denoted, namely return on assets and economic value added, under model 1 and 2, respectively. In addition, robust standard errors for heteroskedasticity, industry-year effects, and firm specific control variables are specified in both equations.

As observed, the effect from the ESG score is reported as statistically significant, at the 1% level in both regressions, while positively contributes to economic performance. Furthermore, the evidence from model 1 is in agreement with that of Fischer and Sawczyn (2013) and Dalal and Thaker (2019), implying that firms are rewarded in terms of bottom-line profit margins, as well as asset-use efficiency, as a consequence of higher standards of socially responsive behavior.

Following with the analysis, the evidence from model 2, bolsters the argument that increased ESG performance is significantly associated with greater economic profits, i.e., return on invested capital exceeding the cost of financing the capital employed in the business, albeit, divergent from the scarce literature employing economic value added on the scope of research, namely Mittal et al. (2018). Hence, adding evidence that planning and acting responsibly does not necessarily involve the detour of capital and resources

(Allouche & Laroche, 2005), instead has the ability to yield competitiveness and reduce downside risks, through the effective and sustainable allocation of capital in the long run.

Table II. Ordinary Least-Squares (OLS) Regressions

Variables	Return on Assets (1)	EVA Margin (2)
ESG Score	0.0744***	0.0826***
	(0.0168)	(0.0243)
Leverage	-0.1067***	-0.0324
	(0.0164)	(0.0296)
Size	-0.0285***	-0.0138***
	(0.0055)	(0.0028)
Capex margin	0.0220***	0.0498**
	(0.0073)	(0.0244)
R&D margin	-0.0983***	-1.0662***
	(0.0202)	(0.0613)
Revenue Growth	-0.0015	0.0206
	(0.0015)	(0.0212)
Interception	0.7086***	0.3241***
	(0.1189)	(0.0605)
Year	Yes	Yes
Industry	Yes	Yes
Observations	2,761	1,845
R-squared	0.1526	0.7048
Wald Test	0.000	0.000

Note: *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. Additionally, t statistics are presented in parentheses. All variables are defined in Appendix I.

Therefore, findings from models 1 and 2, clearly emphasize that there are no notable differences depending on which measurement of economic performance is considered as dependent variable. For this reason, suggesting that by reshaping corporate strategy and brand positioning, through the incorporation of a strong sustainable preposition, firms are prone to build competitive advantages and consequently drive economic performance.

Regarding the relationship between each ESG sub-index score, environmental, social and governance, and firm's economic performance, the regressions presented in table III, further explore the magnitude and differential effects in regard to individual dimensions of corporate sustainability and whether they are meaningful.

As expected, the results present a similar understanding, with positive coefficients, usually at the 1% and 5% levels of significance, albeit lower magnitudes in comparison with the inclusive ESG score. Nevertheless, concerning the question whether corporate sustainability dimension is more consequential, regarding the effect on firm's economic performance, governance proved to marginally outperform in all the subsequent models, thus, inferring that social and environmental performance scores may be more sensitive to distinct features. The results differ from prior literature (Cek & Eyupoglu, 2020, Yawika & Handayani, 2019), where the heterogeneity of outcomes prevents consensus regarding the relevance of each individual dimension.

Table III. Ordinary Least-Squares (OLS) Regressions

Variables	Return on Assets (3)	Return on Assets (4)	Return on Assets (5)	EVA Margin (6)	EVA Margin (7)	EVA Margin (8)
Environmental Score	0.0372*** (0.0080)			0.0298* (0.0180)		
Social Score		0.0156** (0.0072)			0.0385** (0.0186)	
Governance Score			0.0538*** (0.0173)			0.0673*** (0.0167)
Leverage	-0.1054*** (0.0163)	-0.1077*** (0.0167)	-0.1107*** (0.0171)	-0.0302 (0.0296)	-0.0315 (0.0298)	-0.0394 (0.0299)
Size	-0.0269*** (0.0050)	-0.0246*** (0.0043)	-0.0258*** (0.0051)	-0.0111*** (0.0028)	-0.0111*** (0.0025)	-0.0112*** (0.0025)
Capex margin	0.0237*** (0.0075)	0.0236*** (0.0075)	0.0207*** (0.0070)	0.0523** (0.0242)	0.0514** (0.0244)	0.0453* (0.0242)
R&D margin	-0.0952*** (0.0187)	-0.0975*** (0.0195)	-0.1013*** (0.0217)	-1.0641*** (0.0626)	-1.0665*** (0.0620)	-1.0703*** (0.0602)
Revenue Growth	-0.0020 (0.0014)	-0.0028* (0.0016)	-0.0023 (0.0016)	0.0181 (0.0211)	0.0175 (0.0211)	0.0157 (0.0211)
Interception	0.6915*** (0.1139)	0.6527*** (0.1018)	0.6606*** (0.1115)	0.2939*** (0.0629)	0.2886*** (0.0585)	0.2792*** (0.0588)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,761	2,761	2,761	1,845	1,845	1,845
R-squared	0.1477	0.1445	0.1523	0.7032	0.7034	0.7054
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, t statistics are presented in parentheses. All variables are defined in Appendix I.

Regarding firm-specific controls, with fewer exceptions, regressors are statistically significant, and thus, substantial for economic performance. Although, not the central scope of the study, the expected signs were not confirmed regarding firm's Size and R&D margins, which consistently displayed negative coefficients. Nonetheless, on balance, results are similar to those of Lioui and Sharma (2012) and Dalal and Thaker (2019), and supportive of the following arguments; undertaking new investments on tangible assets yields economic benefits, firm's excessive financial burden may contribute to downgrade performance and R&D expenditures do not necessarily create value in the short run.

Table IV. Ordinary Least-Squares (OLS) Regressions

Variables	Net profit margin (9)	Asset Turnover (10)
ESG Score	0.0929**	0.3231***
	(0.0378)	(0.0530)
Leverage	-0.1792***	-0.6847***
	(0.0388)	(0.0619)
Size	-0.0135***	-0.1033***
	(0.0036)	(0.0089)
Capex margin	-0.0515	0.4272***
	(0.0573)	(0.0901)
R&D margin	-0.8994***	-0.3026***
	(0.0949)	(0.1129)
Revenue Growth	0.0144	-0.0135
	(0.0137)	(0.0104)
Interception	0.3451***	3.2514***
	(0.0704)	(0.1915)
Year	Yes	Yes
Industry	Yes	Yes
Observations	2,761	2,761
R-squared	0.5519	0.3363
Wald Test	0.000	0.000

Note: *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. Additionally, t statistics are presented in parentheses. All variables are defined in Appendix I.

Furthermore, to comprehend the additional scope of research, table IV, advances the results concerning which spheres of economic performance present higher sensitiveness and/or are more impacted by firm's socially responsive behaviour. For this effect, the following models are estimated on account of the additional analysis described in section 3.4, representing the decomposition of return on assets as alternative dependent variables,

accordingly to the model of Dupont. Thus, under equation 9 and 10, both net profit margin and asset turnover are introduced, respectively.

Finally, from the results presented in table IV, it can be inferred that firm's increased commitment as well as socially responsive awareness, influences distinct, even so, complementary layers of economic performance. Hence, considering the meaningful and positive coefficients from both ESG scores, under equations 9 and 10, an interesting and comprehensive assessment is provided, regarding how stronger levels of sustainable performance may translate into increased profit margins, without negatively impact cost benefit trade-offs.

Therefore, these findings shed light to the argument, that by addressing stakeholders consciousness and demands, as well as changes in consumption patterns and expectations in a globally competitive environment, corporate sustainability acts as differentiation and innovation driver, and consequently enhances both firms legitimacy and reputation. Thus, as a result of mediating effects, sustainable performance may yield economic results.

The remaining and detailed analysis concerning the re-estimation of the equations presented in table IV, which aim to further explore the association between each ESG sub-index score and both singular components of economic performance, as measured by the decomposition of return on assets, is presented in the course of Appendix III.

4.3. Robustness

The prior literature, albeit scarce and unconclusive, was mostly limited to the use of a least-squares method to advance the statistical analysis. Although, given the specific features of the sample, considering both cross-sectional and time-series observations, the appropriateness of an ordinary least squares (OLS) regression remains doubtful in former research (Dalal & Thaker, 2019). As such, attempting to overcome possible constrains of previous studies, the use of panel data techniques has been applied to control potentially correlated, unobserved, time-invariant heterogeneity (Arellano, 2003).

Therefore, the primary question is whether unobserved firm-specific variables are insignificantly correlated to those of the other firms in the analysis (Gerged, Beddewela & Cowton, 2021). If confirmed, fixed effects estimations are more adequate, otherwise

random effects should be considered (Lioui & Sharma, 2012). The specification depends on the results from the Hausman test and in the course of this section are highlighted for each regression in the respective statistical results tables.

Furthermore, the following econometric setting accounts for industry-year effects and/or specifications, under panel data methods, in view of several motivations. First, to accommodate each economic sector idiosyncrasies, required social behaviour and degree of regulation, which consequently influences firm's economic performance, as well as the effectiveness and adequacy of sustainable policies and practices (Fischer & Sawczyn, 2013). Secondly, to capture the correlation between the stages of the economic cycle, i.e., the underline macroeconomic outlook, as well as growth cyclicality over the years with firm-level performance (Gonçalves, Gaio & Lélis, 2020).

In addition, previous decade accommodative monetary policy and increased fiscal stimulus from central banks led to minimum levels of risk-free interest rates. Thus, reduced financing costs and likely wider return spreads, drive the need of additional bias controls when economic performance is measured through economic value added.

Although, it should be noticed that regardless of the Hausman test instruction, an exception was carefully considered in view of the prior economic rationale discussed, more in depth, regarding the introduction of economic value added as dependent variable. Thus, has been decided to specifically define both year and industry fixed controls under the structure of model 2, in table V, while controlling for random effects, which can be more suited to capture firm's heterogeneities (Lioui & Sharma, 2012).

Therefore, the previous base models from Table II, were re-estimated and subject to panel-data techniques, namely a random effects econometric specification as highlighted in table V for both models. Thus, including both comprehensive measures of economic performance and the overall ESG score, as prior described in section 3.4, the results from both models 1 and 2 in table V, strengthen the consistency and robustness of the analysis, by reinforcing the previous pattern of a statistically significative, once again at 1% level, and positive association regarding firm's sustainable and economic performance. Hence, validating *H1*.

Table V. Fixed and Random Effects Regressions

Variables	Return on Assets (1)	EVA margin (2)
ESG Score	0.0476***	0.0859***
	(0.0096)	(0.0291)
Leverage	-0.0729***	-0.1248***
	(0.0111)	(0.0294)
Size	-0.0226***	-0.0266***
	(0.0024)	(0.0049)
Capex margin	0.0033	0.0353*
	(0.0070)	(0.0183)
R&D margin	-0.0947***	-1.1665***
	(0.0105)	(0.0187)
Revenue Growth	0.0026*	0.0266***
	(0.0014)	(0.0089)
Interception	0.5763***	0.6345***
	(0.0519)	(0.1054)
Fixed Effects	No	No
Random Effects	Yes	Yes
Year	No	Yes
Industry	No	Yes
Observations	2,761	1,845
Wald Test	0.000	0.000
Number ID	399	390

Note: *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. Additionally, t statistics are presented in parentheses. All variables are defined in Appendix I.

Furthermore, it should be observed that the adjustments performed in table V, and discussed in this section, are analogous to those in the equations presented in table VI, following the same rationale. Nevertheless, when re-estimating the models from table III in section 4.1, and conversely to prior results, after controlling for both fixed and random effects, accordingly, is immediately noticed that the association between firm's level of governance and economic performance is reported as insignificant, under both models 5 and 8, presented in table VI. Although, these findings were mostly expected, considering that the construction of the sample only comprised listed and large capitalized firms in Europe, and thus, illustrating there are no significant time-variant heterogeneities in this context.

Additionally, all things considered, environmental and social individual performance scores retained the consistency of a statistically significant and positive impact on firm's

economic performance, albeit overall lower magnitudes, as also previously noted in the former section 4.1. Even though, the social score to a lesser extent in view of the results from model 7, when employing economic value added as dependent variable.

Table VI. Fixed and Random Effects Regressions

Variables	Return on Assets (3)	Return on Assets (4)	Return on Assets (5)	EVA Margin (6)	EVA Margin (7)	EVA Margin (8)
Environmental Score	0.0299*** (0.0085)			0.0882*** (0.0227)		
Social Score		0.0364*** (0.0070)			0.0218 (0.0220)	
Governance Score			0.0067 (0.0062)			0.0277 (0.0175)
Leverage	-0.0731*** (0.0111)	-0.0718*** (0.0111)	-0.0754*** (0.0116)	-0.1208*** (0.0294)	-0.1270*** (0.0295)	-0.1284*** (0.0294)
Size	-0.0203*** (0.0023)	-0.0221*** (0.0023)	-0.0154*** (0.0027)	-0.0286*** (0.0049)	-0.0223*** (0.0048)	-0.0217*** (0.0045)
Capex margin	0.0035 (0.0070)	0.0045 (0.0070)	0.0024 (0.0073)	0.0368** (0.0182)	0.0365** (0.0183)	0.0352* (0.0183)
R&D margin	-0.0932*** (0.0105)	-0.0939*** (0.0105)	-0.1147*** (0.0141)	-1.1640*** (0.0188)	-1.1671*** (0.0188)	-1.1677*** (0.0187)
Revenue Growth	0.0025* (0.0014)	0.0024* (0.0014)	0.0022 (0.0014)	0.0280*** (0.0089)	0.0251*** (0.0089)	0.0249*** (0.0089)
Interception	0.5339*** (0.0506)	0.5689*** (0.0510)	0.4414*** (0.0600)	0.6787*** (0.1066)	0.5746*** (0.1046)	0.5585*** (0.1015)
Fixed Effects	No	No	Yes	No	No	No
Random Effects	Yes	Yes	No	Yes	Yes	Yes
Year	No	No	No	Yes	Yes	Yes
Industry	No	No	No	Yes	Yes	Yes
Observations	2,761	2,761	2,761	1,845	1,845	1,845
R-squared			0.0667			
Wald Test	0.000	0.000	0.000	0.000	0.000	0.000
Number ID	399	399	399	390	390	390

Note: *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. Additionally, t statistics are presented in parentheses. All variables are defined in Appendix I.

Nevertheless, the findings from this thesis, considering all the statistical framework implemented so far, are robust for alternative dimensions of corporate sustainability, and thus, underline that developing a core sustainable strategy, even if anchored or as leaders in one pillar of the ESG dimensions, contributes to drive economic results at a corporate

level. Thus, accounting for the fact that governance scores did present weaker evidence, on balance, *H2*, *H3* and *H4*, corresponding to research question II, are validated.

Regarding the association between different components of economic performance, by considering the decomposition of return on assets and firm's overall ESG score as an incremental analysis into the scope of research, as denoted in prior sections, the preceding adaptations are also carried in both models from table VII. Thus, similarly, the equations 9 and 10, considering the introduction of net profit margin and asset turnover as dependent variables, are also disclosed under panel data methods. As such, once again, considering fixed and random effects, under the instruction of the Hausman test.

Table VII. Fixed and Random Effects Regressions

Variables	Net profit margin (9)	Asset turnover (10)
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 margin	-0.0608	0.0762***
	(0.0419)	(0.0252)
R&D margin	-1.0300***	-0.1801***
	(0.0806)	(0.0485)
Revenue Growth	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	2,761	2,761
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, t statistics are presented in parentheses. All variables are defined in Appendix I.

Following with the analysis, these findings from model 9 and 10, provide an extra robustness into the scope of research, and further reinforce, now exclusively at 1% level of significance, the meaningful and positive influence of increased standards of corporate

sustainability on firm's economic results, while helping to better clarify the channelling of this practices and commitments into different layers of economic activity.

Moreover, this thesis offers extra robustness tests with the aim of exploring any room for further doubts regarding the consistency and validity of prior results. For this effect, and following the authors Gerged, Beddewela and Cowton (2021) and Nuskiya et al. (2021), the adoption of a dynamic panel data specification is introduced in the literature. Hence, in view of Arellano and Bond (1991), a two-step system generalized method of moments (GMM) estimator is conducted with the purpose of confirming that previous outcomes are not significantly influenced with the presence of endogeneity and reverse causality concerns (Blundell and Bond, 1998).

Therefore, the methodology comprehends an internal metamorphosis of data where the lagged variable is subtracted from its present value, and thus, improving the efficiency of the GMM estimator (Wooldridge, 2016). In addition, the two-step system approach is considered in order to limit unnecessary data loss and increase the coefficients estimation consistency (Wooldridge, 2016).

Finally, comprehending the core of research, and in view of return on assets as the primary measure of economic performance employed in prior literature, with an identical purpose, models presented in table VIII adopted a two-step system generalized method of moments (GMM) specification, accounting for ROA as dependent variable, where both post-estimation tests, the Hansen and Arellano-Bond figures are examined to evaluate whether the instruments, the lagged regressors of the dependent variable, are correctly specified, i.e., are exogenous, a fundamental assumption to confirm the soundness of the dynamic GMM estimator (Ullah, Akhtar & Zaefarian, 2018).

Nevertheless, instead of a first and second-year lags of the dependent variable, both considered as explanatory regressors, the equations from table VIII, only denote one lagged variable of economic performance, result of a non-statistically significant auto-regressive coefficient of order 2.

Therefore, as expected, the models from table VIII further underpin a statistically significant, at 1% level, and positive association between firm's sustainable and economic performance, while not only considering an aggregate dimension through the overall ESG score, but also shedding light to the notion that firms are rewarded in terms of economic

results for individual efforts, mostly on social and environmental dimensions. Hence, to the best of our knowledge, owning the narrative shift from a conventional business model and perspective to the inclusion of a sustainable core strategy and agenda, that satisfies stakeholders consciousness and demands of a legitimate organization, drives firms value.

Table VIII. Two-step system GMM Regression

Variables	Return on Assets (11)	Return on Assets (12)	Return on Assets (13)	Return on Assets (14)
Return on Assets Lagged	0.7012*** (0.0641)	0.6835*** (0.0640)	0.8877*** (0.0386)	0.6948*** (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*** (0.0083)	-0.0329*** (0.0083)	-0.0149*** (0.0047)	-0.0315*** (0.0084)
Size	-0.0057*** (0.0011)	-0.0058*** (0.0011)	-0.0024*** (0.0005)	-0.0049*** (0.0010)
Capex margin	0.0073 (0.0051)	0.0093** (0.0044)	0.0054 (0.0048)	0.0107** (0.0048)
R&D margin	-0.0223 (0.0174)	-0.0257* (0.0153)	-0.0156* (0.0094)	-0.0213 (0.0151)
Revenue Growth	0.0148 (0.0112)	0.0130 (0.0103)	0.0117 (0.0097)	0.0124 (0.0085)
Interception	0.1431*** (0.0294)	0.1537*** (0.0289)	0.0567*** (0.0138)	0.1372*** (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	2,357	2,357	2,357	2,357
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, t statistics are presented in parentheses. All variables are defined in Appendix I.

Lastly, following Gonçalves, Pimentel and Gaio (2021), a final supplemental analysis is conducted to overcome potential distortions concerning time-window biases. First, by considering the increasing demand and popularity regarding "going sustainable", and also the wider media attention and covering to scandals in this matter, at the enterprise level, after 2015. Secondly, taking into account the fact that economic value added regressions only contain observation from years 2015 onwards, due to unavailability of data.

Table IX. Ordinary-Least-Squares (OLS) Regressions

Variables	Return on Assets (1)	Net Profit Margin (2)	Asset Turnover (3)	Return on Assets (4)	Return on Assets (5)	Return on Assets (6)
ESG Score	0.0744*** (0.0168)	0.0929** (0.0378)	0.3231*** (0.0530)			
Environmental Score				0.0372*** (0.0080)		
Social Score					0.0156** (0.0072)	
Governance Score						0.0538*** (0.0173)
Leverage	-0.1067*** (0.0164)	-0.1792*** (0.0388)	-0.6847*** (0.0619)	-0.1054*** (0.0163)	-0.1077*** (0.0167)	-0.1107*** (0.0171)
Size	-0.0285*** (0.0055)	-0.0135*** (0.0036)	-0.1033*** (0.0089)	-0.0269*** (0.0050)	-0.0246*** (0.0043)	-0.0258*** (0.0051)
Capex margin	0.0220*** (0.0073)	-0.0515 (0.0573)	0.4272*** (0.0901)	0.0237*** (0.0075)	0.0236*** (0.0075)	0.0207*** (0.0070)
R&D margin	-0.0983*** (0.0202)	-0.8994*** (0.0949)	-0.3026*** (0.1129)	-0.0952*** (0.0187)	-0.0975*** (0.0195)	-0.1013*** (0.0217)
Revenue Growth	-0.0015 (0.0015)	0.0144 (0.0137)	-0.0135 (0.0104)	-0.0020 (0.0014)	-0.0028* (0.0016)	-0.0023 (0.0016)
Year 2015	0.0023 (0.0087)	0.0623*** (0.0233)	-0.0582* (0.0342)	0.0039 (0.0088)	0.0034 (0.0089)	0.0038 (0.0088)
Interception	0.7086*** (0.1189)	0.3451*** (0.0704)	3.2514*** (0.1915)	0.6915*** (0.1139)	0.6527*** (0.1018)	0.6606*** (0.1115)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,761	2,761	2,761	2,761	2,761	2,761
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, t statistics are presented in parentheses. All variables are defined in Appendix I.

In this sense, the ordinary least squares regressions from section 4.1, are re-estimated with a dummy variable accounting for the year 2015, and presented in table IX. It should be overserved, that this adjustment was considered for primary and additional analysis of this research, employing alternative metrics of economic performance, as well as overall and individual dimensions of the ESG scores, which once again corroborate the level of significance and positive impact denoted in previous results.

5. CONCLUSION

This thesis aims to evaluate the association between firm's sustainable and economic performance in Europe, as well as intending to comprehend the magnitude and differential effects of individual sustainability dimensions in the ESG universe (environmental, social and governance). Furthermore, a supplementary analysis has the purpose of investigating the influence and channelling of corporate sustainability, while accounting for different layers of economic activity.

Therefore, this research was built on data collected from Thomson Reuters Refinitiv, more in depth, a sample composed of currently listed Euro Stoxx 600 Index firms, from the time-period 2012-2020. In addition, the ESG scores from Refinitiv are employed to represent the multidimensionality of firm's sustainable performance, whereas different metrics are introduced to capture the concept of economic performance.

Furthermore, drawing on the stakeholder and legitimacy theory, the results of this study further strengthen the statistically significant and positive association between firms socially responsive behaviour and economic performance. In agreement with the authors Fischer and Sawczyn (2013), Dalal and Thaker (2019) and Ferrero-Ferrero et al. (2016), this study implies that firms are rewarded in terms of competitive advantages as a result of addressing stakeholders needs and demands in a globally and competitive environment.

Moreover, these findings reinforce that owing the narrative shift from a conventional business model and perspective to the incorporation of a core sustainable preposition and agenda, even if anchored or as leaders in one individual ESG dimension, drives economic results, albeit lower magnitudes and weaker evidence in regard to corporate governance. Although, considering the heterogeneity of outcomes in the literature, prevents consensus (Cek & Eyupoglu, 2020; Yawika & Handayani, 2019).

In depth, and also considering the supplementary analysis from this study, planning, and acting responsibly is undoubtedly a first order business, and definitely not a waste of capital and/or resources. In contrast, corporate sustainability, aligned with both changes in consumptions patterns and expectations, translates into higher profit margins without negatively impact cost-benefit trade-offs. Thus, is safe to assume that increased standards of corporate sustainability drives complementary dimensions of economic performance, mostly as a result of mediating effects, namely both reputation and legitimacy, as well as enhanced differentiation and innovation.

Finally, as pointed out in the introduction, this research offers significant contribution to prior literature and insightful remarks, offering managers and policy makers practical implications. First, contributes to tighten the gap in the literature, which at the moment, remains scarce and unclear (Dalal & Thaker 2019; Fischer & Sawczyn, 2013; Lioui & Sharma, 2012), by providing a recent and innovative analysis in the scope of research, considering an endogenous sample, composed of listed and large capitalized firms, on a Pan-European context.

Secondly, beyond a traditional financial perspective and of contrast to the evidence presented in Lioui and Sharma (2012), this thesis reinforces previous findings in regard to a statistically and positive relationship between sustainable and economic performance, in agreement with the following authors, Dalal and Thaker (2019), Ferrero-Ferrero et al. (2016) and Fischer and Sawczyn (2013).

Thirdly, 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, although, albeit lower magnitudes and considering weaker evidence regarding corporate governance.

Fourthly, and to the best of our knowledge, this paper is the first to introduce both economic value added and the ESG scores into the knowledge domain, aiming to provide an innovative value-added perspective, as well as an up-to date and consensual substance regarding sustainable performance.

Fifthly, and also to the best of our knowledge, is the first study to comprehensively examine the influence and extent of corporate sustainability, while considering different components of economic performance, namely bottom-line profit margins and asset-use efficiency, through the decomposition of return on assets, accordingly to the model of Dupont.

Finally, the results from this study are still valid and robust, when applying panel data methods and following comprehensive econometric settings. First, employing fixed and random effects regressors, which aim to control potentially correlated, unobserved, time-invariant heterogeneity (Arellano, 2003). Secondly, these findings are also unchangeable, accounting for potential distortions, resulting from both endogeneity concerns and reverse causality biases, in view of Arellano and Bond (1991). Thus, by implementing a two-step dynamic generalized method of moments (GMM), following the authors (Nuskiya et al. (2021); Gerged, Beddewela & Cowton, 2021). Lastly, aiming to leave no room for further doubts, and accordingly to Gonçalves, Pimentel and Gaio (2021), these findings are still congruous and stable when controlling for time-window biases, when the momentum and popularity of "going sustainable" reached new levels after 2015.

Future research avenues might explore the research design of this thesis and address the following limitations. For instance, in view of inherent accounting distortions and considering a sample composed of different industry-driven asset intensity, employing alternative and/or additional measures of economic performance, namely as few papers attempted to do so, employing risk-adjusted annual returns, grounded on a strong or semi-strong market efficiency theory (Al-Tuwaijri et al., 2004).

Furthermore, to overcome potentially greenwashing or reporting biases (Gonçalves, Gaio & Costa, 2020), an identical study can be advanced by exploring different methods to capture firm's sustainable performance, such as the ESG Controversies score, which aims to discount the impact of scandals and negative media covering on the combined score, and also the occurrence of further developments, or even other providers of data.

Finally, considering that the focus of this research consists in the largest capitalized and listed firms in Europe, it is acknowledged that this methodology should be extended to different geographies, as well as non-listed firms, aiming to comprehend distinctive

factors that may significantly influence this relationship, namely countries legal origin and institutional settings, socio-cultural factors, economic development and industry intensity and degree of regulation.

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APPENDICES

Appendix I. Variables Definition

Panel A. Dependent Variables

Return on Assets	Net Profit Margin*Asset Turnover	Fischer and Sawczyn (2013)
Net Profit Margin	Income After Taxes/Revenues	Author
Asset Turnover	Revenues/Total Assets	Author
Economic Value Added	(ROIC-WACC) *Invested Capital	Stewart (2009)
EVA Margin	EVA/Revenues	Stewart (2009)

Panel B. Explanatory Variables

ESG Score	ESG combined score obtained from Refinitiv	Ferrero-Ferrero et al. (2016)
Environmental Score	Environmental pillar score obtained from Refinitiv	Cek and Eyupoglu (2020)
Social Score	Social pillar score obtained from Refinitiv	Cek and Eyupoglu (2020)
Governance Score	Governance pillar score obtained from Refinitiv	Cek and Eyupoglu (2020)

Panel C. Control Variables

Size	Natural Logarithm of Total Assets	McWilliams and Siegel (2000)
Leverage	Total Debt/Total Assets	Dalal and Thaker (2019)
R&D	R&D/Revenues	Lioui and Sharma (2012)
Capex	Capex/Revenues	Lioui and Sharma (2012)
Revenue Growth	(Total Revenue$_t$ – Total Revenue$_{t-1}$)/Total Revenue$_{t-1}$	Ferrero-Ferrero et al. (2016)

Panel D. Complementary Variables

NOPAT	EBIT*(1-Tax rate)	Stewart (2009)
Invested Capital	Total Equity + Total Debt	Stewart (2009)
ROIC	NOPAT/Invested Capital	Stewart (2009)
WACC	Obtained from Refinitiv	

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Appendix II. Pearson Correlation Matrix

Variables	Return on Assets	Net Profit margin	Asset Turnover	EVA margin	ESG Score	Environmental Score	Social Score	Governance Score	Leverage	Size	Capex margin	R&D margin	Revenue Growth
Return on Assets	1.000												
Net Profit margin	0.198*	1.000											
Asset Turnover	0.376*	-0.219*	1.000										
EVA margin	0.266*	0.203*	0.185*	1.000									
ESG score	-0.090*	-0.038*	-0.044*	0.062*	1.000								
Environmental score	-0.120*	0.014	-0.071*	0.088*	0.845*	1.000							
Social score	-0.123*	-0.049*	-0.058*	0.038	0.883*	0.701*	1.000						
Governance score	-0.006	-0.050*	0.016	0.022	0.663*	0.331*	0.365*	1.000					
Leverage	-0.190*	0.110*	-0.352*	0.004	0.095*	0.094*	0.078*	0.058*	1.000				
Size	-0.311*	-0.030	-0.264*	0.025	0.531*	0.554*	0.464*	0.275*	0.243*	1.000			
Capex Margin	0.069*	-0.098*	0.280*	0.069*	0.010	-0.017	0.007	0.037	-0.254*	-0.043*	1.000		
R&D Margin	-0.076*	-0.401*	-0.099*	-0.786*	-0.021	-0.106*	0.001	0.042*	-0.111*	-0.104*	-0.010	1.000	
Revenue Growth	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: *, ** and *** refer to 10%, 5% and 1% significance levels, respectively.

Appendix III. Ordinary Least Squares (OLS) Regressions

Variables	Net Profit Margin (11)	Net Profit Margin (12)	Net Profit Margin (13)	Asset Turnover (14)	Asset Turnover (15)	Asset Turnover (16)
Environmental Score	0.0689** (0.0294)			0.1474*** (0.0422)		
Social Score		0.0343 (0.0273)			0.1747*** (0.0412)	
Governance Score			0.0627*** (0.0211)			0.2042*** (0.0402)
Leverage	-0.1759*** (0.0388)	-0.1799*** (0.0389)	-0.1840*** (0.0391)	-0.6804*** (0.0620)	-0.6849*** (0.0622)	-0.7009*** (0.0625)
Size	-0.0135*** (0.0037)	-0.0097*** (0.0031)	-0.0099*** (0.0028)	-0.0948*** (0.0089)	-0.0939*** (0.0077)	-0.0902*** (0.0081)
Capex margin	-0.0493 (0.0569)	-0.0497 (0.0574)	-0.0529 (0.0575)	0.4346*** (0.0904)	0.4330*** (0.0892)	0.4230*** (0.0892)
R&D margin	-0.8942*** (0.0970)	-0.8986*** (0.0954)	-0.9027*** (0.0939)	-0.2897*** (0.1071)	-0.3009*** (0.1109)	-0.3132*** (0.1171)
Revenue Growth	0.0144 (0.0140)	0.0131 (0.0131)	0.0133 (0.0128)	-0.0161 (0.0109)	-0.0168 (0.0115)	-0.0175 (0.0134)
Interception	0.3571*** (0.0743)	0.2910*** (0.0671)	0.2832*** (0.0650)	3.1562*** (0.1936)	3.1216*** (0.1761)	3.0299*** (0.1808)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,761	2,761	2,761	2,761	2,761	2,761
R-squared	0.5519	0.5508	0.5517	0.3299	0.3306	0.3337
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, t statistics are presented in parentheses. All variables are defined in Appendix I.