

Cuando lo verde significa crecimiento: integración ESG, creación de valor social y resultados financieros en las pymes a nivel mundial

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ES Resumen. En una economía cada vez más globalizada, las pequeñas y medianas empresas (pymes) desempeñan un papel fundamental no solo en la creación de valor, sino también en la cohesión social, la generación de empleo y el desarrollo territorial sostenible. En este contexto, la integración de criterios ambientales, sociales y de gobernanza (ESG) ha surgido como un mecanismo estratégico mediante el cual las empresas alinean el desempeño económico con objetivos sociales y ambientales más amplios, sin sacrificar necesariamente la viabilidad financiera. Este estudio examina la relación entre las prácticas ESG y los resultados financieros de las pymes, haciendo especial hincapié en su contribución a modelos económicos socialmente responsables y sostenibles.

Utilizando datos empresariales de la base de datos Eikon correspondientes al año 2024, el análisis se centra en pymes que operan en seis grandes regiones: América del Norte, Europa, América Latina, África, Asia y Oceanía. El desempeño financiero se evalúa mediante cuatro indicadores clave: rentabilidad sobre el patrimonio (ROE), rentabilidad sobre los activos (ROA), capital circulante e ingresos, mientras que las dimensiones ESG reflejan el compromiso de las empresas con la gobernanza responsable, la responsabilidad social y la gestión ambiental. Se emplea un enfoque de regresión multivariante segmentado por continente para tener en cuenta las diferencias regionales en los marcos institucionales, el desarrollo de los mercados y las normas relacionadas con la sostenibilidad.

Los resultados revelan efectos heterogéneos de la integración ESG sobre el desempeño financiero y ponen de manifiesto importantes disparidades regionales. En particular, los hallazgos sugieren que la adopción de criterios ESG puede reforzar la resiliencia financiera de las pymes y, al mismo tiempo, respaldar prácticas empresariales de orientación social alineadas con los principios de la economía social. Al demostrar que las estrategias de sostenibilidad pueden reforzar tanto el desempeño económico como la creación de valor social, este estudio contribuye a la literatura sobre economía social y emprendimiento responsable, y subraya la necesidad de políticas sensibles al contexto que promuevan un desarrollo de las pymes inclusivo, sostenible y socialmente integrado.

Palabras clave. Pymes, ESG, economía social, desempeño financiero, desarrollo sostenible, gobernanza corporativa, creación de valor social.

Claves Econlit. F30, B55, G30, Q01.

ENG When Green means Growth: ESG integration, social value creation, and financial outcomes in SMEs worldwide

ENG Abstract. In an increasingly globalized economy, small and medium-sized enterprises (SMEs) play a pivotal role not only in value creation but also in social cohesion, employment generation, and sustainable territorial development. Within this context, the integration of environmental, social, and governance (ESG) criteria has emerged as a strategic mechanism through which firms align economic performance with broader social and environmental objectives, without necessarily sacrificing financial viability. This study examines the relationship between ESG practices and financial outcomes in SMEs, emphasizing their contribution to socially responsible and sustainable economic models.

Using firm-level data from the Eikon database for the year 2024, the analysis focuses on SMEs operating across six major regions: North America, Europe, Latin America, Africa, Asia, and Oceania. Financial performance is assessed through four key indicators—Return on Equity, Return on Assets, Working Capital, and Revenue—while ESG dimensions capture firms' engagement with responsible governance, social responsibility, and environmental stewardship. A continent-segmented multivariate regression approach is employed to account for regional differences in institutional frameworks, market development, and

sustainability-related norms.

The results reveal heterogeneous effects of ESG integration on financial performance, highlighting notable regional disparities. Importantly, the findings suggest that ESG adoption can strengthen the financial resilience of SMEs while simultaneously supporting socially-oriented business practices aligned with the principles of the social economy. By demonstrating that sustainability strategies reinforce both economic performance and social value creation, this study contributes to the literature on the social economy and responsible entrepreneurship, underscoring the need for context-sensitive policies that foster inclusive, sustainable, and socially embedded SME development.

Keywords. SMEs, ESG, social economy, financial performance, sustainable development, corporate governance, social value creation.

Summary. 1. Introduction. 2. State of the art. 3. Methodology. 4. Results. 5. Discussion of results. 6. Conclusions and future research. 7. References.

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1. Introduction

Addressing the pressing challenges of environmental degradation, social inequality, and economic volatility has placed sustainability at the centre of contemporary economic and business debates. Beyond its environmental dimension, sustainability increasingly responds to structural social challenges such as employment quality, social inclusion, and long-term economic resilience. In this evolving context, firms are expected not only to generate economic value but also to contribute to broader societal objectives. Sustainability has thus gradually become a central element of corporate strategy, particularly as organizations seek to maintain competitiveness and resilience in an increasingly complex and uncertain global landscape.

The transformation of traditional business models into more sustainable and socially responsible frameworks has thus become essential. This transition has catalysed the emergence of Sustainable Business Models (SBMs) and Sustainable Business Model Innovation (SBMI), concepts gradually shaping both academic inquiry and managerial practice (Geissdoerfer, Vladimirova, & Evans, 2018; Shakeel et al., 2020). These approaches stress the integration of environmental and social value creation into core business activities and decision-making processes. They are especially important in the broader framework of the social economy, where economic activity is explicitly linked to social value generation, responsible governance, and long-term societal well-being.

Sustainability is commonly conceptualized through the Triple Bottom Line framework, which highlights the need to balance economic, social, and environmental objectives in organizational strategies (Elkington, 1998). From this perspective, firms are encouraged not only to optimize financial performance but also to generate social value, foster inclusive governance structures, and minimize their environmental footprint. However, implementing these principles presents particular challenges for small and medium-sized enterprises (SMEs). Despite forming the backbone of most economies and playing a crucial role in employment generation and regional development, SMEs often operate under constraints due to limited financial resources, managerial capacity, and restricted access to capital. These limitations can complicate the integration of Environmental, Social, and Governance (ESG) considerations into their business models and increase the perceived trade-offs between sustainability initiatives and short-term financial performance.

At the same time, SMEs' structural configuration generates a distinctive organizational environment for the adoption of sustainability strategies. SMEs typically have highly centralized governance structures and concentrated decision-making authority (Singh & Pillai, 2022). While centralization may limit the formalization of sustainability processes or restrict the allocation of resources to long-term initiatives, it can also enable greater organizational flexibility and faster strategic adaptation in response to emerging sustainability challenges (Jakobs, Salamanca, & Rauch, 2024).

The role of owner-managers becomes particularly significant in this organizational context. The literature highlights that SME leaders exert a substantial influence on organizational priorities and strategic direction, especially in firms with less diffuse governance structures (Factor & Ulhøi, 2021). Their personal values, life experiences, cognitive frames, and normative commitments often shape the extent to which SMEs integrate sustainability considerations into corporate strategies and operational routines. Adoption of sustainability-oriented practices in SMEs thus frequently depends on the perceptions and strategic priorities of a relatively small group of decision-makers.

Despite the growing body of research examining sustainability practices in SMEs, an important gap persists at the intersection between SMEs studies and the strategic role of executive decision-makers in sustainability adoption. Relatively little attention has been devoted to understanding how financial considerations influence SME leaders' willingness to integrate sustainability into their business strategies. This omission is especially important in SMEs, where financial constraints often play a decisive role in shaping strategic priorities and investment decisions.

Building on this research gap, the present study explores the relationship between sustainability-oriented business model strategies and SMEs' financial performance. More specifically, the study addresses the

following research question: How do sustainability-oriented business model strategies, such as SBMs and SBMI, influence SMEs' financial performance across different geographic and institutional contexts?

The primary goal of this study is thus to analyse the relationship between SBM strategies and key financial performance indicators in SMEs. To achieve this goal, the study evaluates how adoption of sustainability practices relates to financial outcomes measured through indicators such as Return on Assets (ROA), Return on Equity (ROE), working capital management, and revenue generation. By examining these relationships across diverse economic and institutional environments, the study aims to provide a more comprehensive understanding of the financial implications of sustainability adoption in SMEs.

A growing body of literature has explored the relationship between sustainable business practices and firm-level financial outcomes (Pérez Estébanez & Sevillano Martín, 2025). Several studies suggest that sustainability-oriented innovations can enhance operational efficiency, improve revenue generation, and strengthen long-term competitiveness, particularly among medium-sized firms and in emerging markets (Morioka, Bolis, & de Carvalho, 2018). Other contributions stress, however, that the financial benefits of sustainability initiatives often materialize in the medium to long term and may require substantial initial investments (Delmas et al., 2015). This temporal mismatch between investment and financial returns poses a significant challenge for many SMEs and partly explains some entrepreneurs' reluctance to adopt sustainability-oriented business models despite their potential social and economic benefits.

To support organizations in this transition, various conceptual frameworks and managerial tools have been developed to facilitate the integration of sustainability into business model design (Pieroni et al., 2019). For example, the Triple Layered Business Model Canvas (TLBMC) proposed by Joyce and Paquin (2016) extends the traditional Business Model Canvas by incorporating environmental and social layers alongside the economic dimension. Similarly, the Sustainable Value Exchange Matrix (SVEM) provides organizations with a structured approach to analysing and managing the relationships between economic, social, and environmental value creation. More recent developments, such as the sustainable and digital Business Model Canvas (Bachmann et al., 2025; Cui, 2025), highlight the growing synergies between sustainability and digital transformation, providing new opportunities for SMEs to improve financial performance and societal impact simultaneously.

From a financial perspective, empirical evidence suggests that SMEs adopting sustainability- and ESG-oriented strategies experience gradual improvements in financial performance indicators such as ROA and ROE, more efficient working capital management, and increased revenue generation (Khan, Ahmad, & Majava, 2021; Poursoleyman et al., 2022). The magnitude and timing of these effects appear, however, to depend on contextual factors including market maturity, institutional quality, technological readiness, and degree of integration of circular economy principles. Regionally disaggregated analyses are thus essential to understand how sustainability-driven strategies interact with diverse economic and institutional environments.

The analysis conducted in this study engages several established theoretical perspectives. First, Stakeholder Theory suggests that firms integrating sustainability into their governance and social practices may benefit from stronger relationships with stakeholders, ultimately contributing to improved financial performance (Freeman et al., 2018). Second, Trade-off Theory stresses the possibility that sustainability investments may generate short-term financial pressures, especially when significant upfront costs are required (Hart & Zingales, 2022). Finally, the Resource-Based View (RBV) argues that SMEs' ability to leverage sustainability for competitive advantage depends on the availability of internal capabilities, organizational resources, and contextual conditions (Barney, 2021; Nguyen & Tran, 2022).

Against this backdrop, this study contributes to the literature in several ways. First, it bridges an important gap between research on SBMs and financial performance in SMEs by examining the relationship between sustainability-oriented strategies and key financial indicators. Second, it extends existing research by focusing on the role of financial considerations in shaping sustainability-related strategic decisions among SME owner-managers. Third, by analysing a global dataset across diverse institutional contexts, the study provides comparative insights into how regional conditions influence the financial outcomes of sustainability strategies.

A deeper understanding of these dynamics is crucial to advance academic research, inform public policy, and support strategic decision-making by business leaders, financial institutions, and social economy stakeholders. By framing sustainability not only as an environmental or ethical imperative but also as a mechanism for social value creation and long-term economic resilience, this study contributes to the broader debate on how SMEs can align their business models with the Sustainable Development Goals, while maintaining financial viability (Schoneveld, 2020). Sustainability thus emerges as a foundational strategy for competitiveness, inclusive growth, and sustainable development in the twenty-first century.

2. State of the art

In recent decades, sustainability has shifted from a marginal concept to a fundamental pillar of corporate strategy. The growing environmental, social, and economic challenges driven by phenomena such as climate change, natural resource scarcity, and social inequality have positioned sustainability at the centre of business transformation (Geissdoerfer, Vladimirova, & Evans, 2018). In this context, the concept of SBM has emerged as a theoretical and practical response that integrates sustainability principles at the core of organizations for good. One of the foundational frameworks for this evolution is Elkington's Triple Bottom Line (1998), which argues that companies must generate not only economic but also social and

environmental value. This perspective expanded the traditional understanding of business success, redirecting it toward broader and more sustainable goals.

The academic literature has mirrored this paradigm shift by developing various theoretical frameworks and tools to operationalize sustainability in business model design. Bocken et al. (2014) proposed a classification of sustainable innovation archetypes, conceptualizing diverse practical strategies to facilitate the transition to more sustainable business models. Subsequently, Joyce and Paquin (2016) introduced the TLBMC, which extends the traditional Business Model Canvas that explicitly incorporates social and environmental dimensions, enabling systemic representation of business interrelations.

In the same vein, Morioka, Bolis, and de Carvalho (2018) developed the SVEM, a framework that maps sustainable value flows among stakeholders and assesses their impact at the organizational level. More recently, Bachmann et al. (2025) adapted the Business Model Canvas to the digital and sustainability environment, proposing a model with 18 elements that strategically integrates digitalization and sustainability, highlighting the need for business models that address technological and environmental challenges simultaneously. The concept of SBMI has gained special relevance as a dynamic process of organizational adaptation and transformation. Geissdoerfer et al. (2018) and Atkova et al. (2025) stress that SBMI involves not only redesign of products and services but also reconfiguration of relationships, activities, and value flows based on sustainable principles. Shakeel et al. (2020), in contrast, argue that sustainable innovation should be understood as a long-term strategy linked to both organizational resilience and the creation of sustainable competitive advantages.

From a financial perspective, numerous studies have explored the relationship between the adoption of sustainable practices and firms' economic performance (Al-Tuwaijri et al., 2004), especially that of SMEs. Khan, Ahmad, and Majava (2021) found evidence of gradual improvements in indicators such as ROA and ROE among SMEs that adopt sustainable strategies. Poursoleyman et al. (2022) confirmed that implementation of ESG practices tends to correlate positively with higher revenues and more efficient management of working capital. Various authors warn, however, that the financial benefits of sustainability are not immediate. Delmas, Nairn-Birch, and Lim (2015) stress that the initial costs of implementing sustainable strategies are often high and economic returns may take several years to materialize. This perspective aligns with the findings of Jonsdottir et al. (2024), who used system dynamics modelling to demonstrate that the positive impacts of sustainable innovation on financial performance tend to appear over time and are contingent on the effectiveness of the strategies implemented.

The results of sectoral and regional analyses show significant heterogeneity (Biggi, Mina, & Tamagni, 2023). While developed markets' sustainability initiatives tend to have a more direct and positive impact on financial performance, the effects vary more in emerging economies, due to factors such as institutional instability, technological gaps, and funding limitations (Poursoleyman et al., 2022). This variability suggests the need for adaptive approaches, where SBMs are designed according to the specific conditions of each context.

The integration of circular economy principles has also become a key strategy in SBMs. Kirchherr et al. (2017) argue that transitioning to circular models, where resources are reused and value is retained within the economic system, provides significant opportunities for innovation and the generation of new revenue streams. Nevertheless, implementation among SMEs faces challenges related to scale, investment capacity, and access to appropriate technologies.

Finally, several works, such as those by Lüdeke-Freund et al. (2016) and Upward and Jones (2016), insist that the transition to SBMs cannot be conceived as merely an operational strategy but requires a profound cultural shift in the organization. Sustainability must be embedded in corporate identity, strategic decision-making, and stakeholder relationships.

A review of the literature shows that SBMs represent a promising pathway for addressing current global challenges, simultaneously generating economic, social, and environmental value. Yet transitioning to these models involves overcoming significant barriers related to costs, capabilities, and organizational resistance. For SMEs—the backbone of the global economy—the challenge is even greater, but so are the opportunities for differentiation and long-term resilience. SBMI thus emerges not only as an ethical and environmental imperative but also as a fundamental strategy for future competitiveness in an increasingly demanding and dynamic business environment.

ESG practices have gained substantial momentum as key components of strategic management in firms seeking long-term viability and social legitimacy. In recent years, the intersection between ESG adoption and financial performance has become a focal point of academic and empirical inquiry, especially in the context of SMEs (Cini & Ferrari, 2024). This discussion aims to reinforce the current understanding of SBMI as a key strategy to align sustainability principles with financial outcomes, as proposed by Geissdoerfer et al. (2018) and expanded by Joyce and Paquin (2016).

Analysing firms listed in the EuroStoxx600 index from 2016 to 2021, Castellano, Cini, and Ferrari (2024) found that companies with high ESG ratings showed higher ROE and lower financial volatility. The authors attributed this finding to the enhanced reputational capital and stakeholder trust that sustainable firms accumulate, which in turn improves investor confidence and capital efficiency. A cross-sector study published in showed that SMEs engaging in sustainable entrepreneurship practices achieved significantly higher ROE than their counterparts. The advantage was substantial precisely in firms operating in clean technology and environmentally innovative sectors, where sustainability was not merely a compliance measure but a core strategic driver. These findings complemented the evidence presented by Khan, Ahmad, and Majava (2021) identifying improvements in ROE among sustainability-driven SMEs and thus highlighting

the role of ESG in long-term shareholder value creation.

Realizing the financial benefits associated with sustainability frequently requires firms to rethink and redesign their underlying business models. Müller et al. (2018) compared large firms and SMEs to examine how these firms reconfigured business models in the context of Industry 4.0. Their study shows that SMEs tend to benefit more from novelty-driven business models than from efficiency-centred approaches, as smaller organizations prioritize cross-company collaboration less. Rather than focusing solely on incremental improvements in existing processes, therefore, SMEs are encouraged to pursue innovative business models that enable the integration of new technologies and sustainability-oriented strategies.

A global multi-sector analysis by Ahmad, Yaqub, and Lee (2024) argues that firms with strong ESG performance consistently outperform in ROA, especially when environmental initiatives are integrated into core operations. Additionally, research grounded in the RBV affirms that internal capabilities in environmental management are instrumental in enhancing ROA (Hu & Zhao, 2024). Firms that view environmental competencies as strategic resources often gain a competitive edge through cost savings, operational efficiency, and improved stakeholder relationships. These findings align with the broader literature on SBMI (Geissdoerfer et al., 2018; Shakeel et al., 2020), reinforcing the notion that sustainability-oriented asset reconfiguration can translate into better financial returns over time. Building on these theoretical and empirical insights, we expect higher levels of sustainability engagement among SMEs to be positively associated with improved financial performance. We therefore propose the following hypotheses:

H1: SMEs with higher sustainability scores have a higher ROA.

H2: SMEs with higher sustainability scores have a higher ROE.

Working capital management, a critical aspect of liquidity and short-term financial health, also benefits from ESG adoption. Sustainable firms often implement more disciplined supply chain and procurement policies, thereby reducing operational inefficiencies. Castellano et al. (2024) argue that ESG practices foster stronger supplier relationships and ethical sourcing, leading to improved inventory turnover and accounts receivable cycles. Firms with comprehensive ESG strategies also tend to face fewer regulatory fines and reputational risks, stabilizing cash flow management. In SMEs, whose financial buffers are limited, optimization of working capital through sustainability-driven risk management can be a key determinant of survival and scalability. Poursoleyman et al. (2022) echo these insights, observing more efficient working capital usage in ESG-aligned SMEs despite the delayed financial returns noted by Delmas, Nairn-Birch, and Lim (2015). Based on these arguments, sustainability engagement is expected to positively influence working capital management in SMEs.

H3: SMEs with higher sustainability scores show higher levels of working capital efficiency.

Revenue growth is tied intrinsically to a company's market positioning, brand equity, and innovation capacity, all of which are positively influenced by ESG practices (Barko, Cremers, & Renneboog, 2022). A scientometric review by Ahmad et al. (2024) indicates that ESG disclosure and transparent sustainability reporting contribute to stronger revenue performance through enhanced customer loyalty, better talent retention, and access to sustainable investment channels. The SME context amplifies revenue advantages when ESG integration is coupled with governance innovation. A study of corporate governance in SMEs (Nkwinka et al., 2024) finds that firms with external advisory boards and independent governance structures tend to implement ESG frameworks more effectively, resulting in measurable gains in revenue streams and customer base expansion. This result is consistent with Poursoleyman et al. (2022), who emphasize the role of ESG in revenue growth through generation of new market opportunities and responsible innovation. Based on this evidence, firms with stronger sustainability engagement are expected to experience higher levels of revenue generation.

H4: SMEs with higher sustainability scores have higher revenues.

Taken together, the evidence from multiple empirical sources underscores that ESG integration is not merely an ethical imperative but a financially sound strategy (Zhou et al., 2022). Positive correlations of ESG performance with ROE, ROA, revenue, and working capital suggest that sustainability can serve as a value driver rather than a cost centre. For SMEs operating in increasingly competitive and regulated global markets, embedding ESG in the core business model may yield both financial resilience and strategic differentiation. These findings affirm the necessity of continued research on ESG-finance linkages and provide a compelling case for SMEs to invest in sustainability, as not only a compliance obligation but also a foundational pillar of financial performance. Furthermore, the discussion aligns coherently with the broader theoretical evolution of SBMI, reinforcing its importance as a pathway to economic viability, environmental stewardship, and long-term competitiveness in both developed and emerging economies.

3. Methodology

This study aims to thoroughly examine the connection between corporate sustainability efforts and financial outcomes by concentrating on four key financial metrics: Return on Equity, Return on Assets, Working Capital, and Revenue. The main goal is to assess whether adopting sustainability-focused strategies has a beneficial impact on firms' financial stability and profitability. The dataset employed in this study was sourced from the Eikon database, encompassing both financial and ESG-related data for the year 2024.

The empirical analysis relies on cross-sectional data for the year 2024. This temporal restriction was

intentionally adopted to ensure consistency in ESG measurement standards and financial reporting frameworks, which have undergone significant harmonization in recent years. Using a single year reduces distortions derived from structural breaks in disclosure regulations and accounting adjustments. However, this design does not allow for causal inference nor for capturing dynamic or lagged effects of ESG implementation. Therefore, the findings should be interpreted as contemporaneous associations rather than longitudinal causal relationships.

The sample was meticulously curated to include exclusively small and medium-sized enterprises (SMEs) operating across the major regions: North America (specifically the United States), Europe, Latin America, Africa, Asia, and Oceania. These regions were strategically selected to ensure a comprehensive yet methodologically consistent representation of global markets. Particular attention was given to maintaining comparability across jurisdictions, especially in terms of regulatory environments, corporate governance standards, and levels of market maturity, which are critical variables for securing the reliability and validity of cross-regional financial and sustainability analysis.

It is important to clarify that the classification of firms as small and medium-sized enterprises (SMEs) follows the criteria embedded in the Refinitiv Eikon database, which in turn relies on jurisdiction-specific regulatory definitions. Consequently, employee thresholds, turnover limits, and balance-sheet criteria vary across regions such as the European Union, the United States, Latin America, Asia, Africa, and Oceania. This definitional heterogeneity implies structural differences in firm scale, financial capacity, and organizational complexity. While the continent-segmented regression approach mitigates direct comparability concerns, results should be interpreted within their respective regional contexts rather than as evidence of strict cross-continental equivalence. This limitation is inherent to global SME research and reflects institutional diversity rather than sampling inconsistency.

To conduct this analysis, we employed a multivariate regression model, which allows for the simultaneous examination of several variables and their influence on financial performance. This model is segmented by continent, allowing us to account for regional differences in economic development, regulatory environments, and sustainability maturity levels. Segmenting the data geographically provides an understanding of how the effects of sustainability initiatives may vary across diverse socio-economic contexts.

Furthermore, the selection of companies was not restricted by industry or economic sector. The sample encompasses a diverse array of companies engaged in various types of economic activity; this inclusive approach was chosen intentionally to facilitate the generalization of results across different sectors, avoiding any biases that might arise from industry-specific characteristics.

By removing such sectoral limitations, the study aspires to offer a more comprehensive understanding of the potential impacts that sustainability initiatives can have on financial performance, regardless of the particular business domain in which a company operates. This inclusive perspective is especially relevant in the current global context, where ESG are increasingly being adopted across all industries as a strategic response to stakeholder expectations, regulatory pressures, and market opportunities.

Ordinary Least Squares (OLS) regression was selected as the primary estimation technique because it enables the identification of marginal associations between ESG dimensions and financial performance indicators while controlling for firm size. The continent-segmented specification allows coefficients to vary structurally across institutional environments, thereby avoiding the imposition of homogeneous global parameters that could mask regional heterogeneity.

To enhance econometric reliability, all models were estimated using heteroskedasticity-consistent (robust) standard errors. This adjustment accounts for potential heteroskedasticity arising from cross-sectional differences in firm size, capital structure, and regional economic conditions, thereby ensuring more reliable statistical inference without altering coefficient estimates. The use of robust standard errors strengthens the validity of hypothesis testing under potential violations of homoscedasticity assumptions.

Given the conceptual proximity among ESG pillars, multicollinearity diagnostics were performed using the Variance Inflation Factor (VIF). The results indicate that VIF values remain below conventional critical thresholds (under 5), suggesting that although moderate correlations exist among ESG dimensions, they do not compromise coefficient stability or estimation reliability. Therefore, all ESG variables were retained in the baseline models.

The specific variables used in the regression model, along with their definitions and sources, are presented in Table 1.

Table 1. Variables description, mean, and standard deviation.

Item	Code	Description	Obs	Mean	Std. Dev.
ROA	ROA	Return on assets %	4,130	-19.89	89.69
ROE	ROE	Return on equity %	3,880	-138.37	4415.65
Revenue		Total income generated by a company from its normal business operations, typically from the sale of goods and services to customers	3,190	1.70	9.64
Working capital	WK	Difference between a company's current assets and current liabilities	3,870	4.22	4.07
Business size	B_S	Number of full employees	4,340	30.29	65.02
Environmental Pillar Score	EPS	Company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long term shareholder value	2,720	13.67	21.37
Social Pillar Score	SPS	Company's capacity to generate trust and loyalty from its workforce, customers, and society, through use of best management practices. Reflects the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long-term shareholder value	2,720	23.22	23.82
Governance Pillar Score	GPS	Company's systems and processes, which ensure that its board members and executives act in the best interests of its long-term shareholders. Reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through creation of incentives, as well as checks and balances to generate long-term shareholder value	2,720	25.91	25.94
Corporate Social Responsibility	CSR	Company's practices to communicate that it integrates the economic (financial), social, and environmental dimensions into its day-to-day decision-making processes	2,720	14.62	25.38

Source: Developed by the authors.

4. Results

The following section presents a continent-level regression analysis examining the relationship between ESG-related indicators and several financial performance measures among SMEs, including ROA, ROE, working capital, and revenue. This segmentation enables identification of regional patterns and significant correlations that may inform adaptation of SBMs to diverse economic and structural conditions.

Unless otherwise specified, only statistically significant coefficients at conventional levels (10%, 5%, and 1%) were interpreted substantively. Non-significant coefficients were reported for completeness but were not considered evidence of systematic association.

The regression analysis employing ROA as the dependent variable revealed considerable regional heterogeneity in the relevance and impact of sustainability indicators (see Table 2).

In the US, several independent variables were significantly associated with ROA. Business size (B_S) showed a strong positive relationship ($p < 0.01$), while the Environmental Pillar Score (EPS), Governance Pillar Score (GPS), and Corporate Social Responsibility (CSR) indicators also display positive and statistically significant associations. The Social Pillar Score (SPS), in contrast, was negatively associated with ROA ($p < 0.01$), possibly reflecting short-term adjustment costs associated with social initiatives that temporarily affect asset efficiency.

In the European (EU) context, multiple sustainability indicators showed statistically significant relationships with ROA. Both B_S and EPS were positively associated with asset performance, and CSR demonstrated a positive and significant impact. Conversely, the GPS showed a negative and statistically significant relationship with ROA, highlighting a potentially complex interaction between governance mechanisms and short-term financial performance.

In LA, Asia, and Africa, none of the independent variables showed statistically significant relationships with ROA at conventional levels, indicating that sustainability indicators have limited immediate explanatory power for asset profitability in these regions. In Oceania, however, EPS showed a positive and statistically significant association with ROA, suggesting that environmental performance contributes to improved asset efficiency in this regional context.

Table 2. Regression Results with ROA as the Dependent Variable.

	LA (0)	EU (1)	US (2)	ASIA (3)	AFRICA (4)	OCEANIA (5)
ROA	Coef. Robust					
B_S	-.1547656	.0338566*	.1067776***	-.0247843	.0134348	.0258345
EPS	.6465569	.1876648**	.3787856***	.037996	-.0484091	.2473655**
SPS	-.3860966	.0422715	-.3804596***	.0256349	.0158853	-.0555369
GPS	.0060362	-.4295161***	.4607367***	-.0645275	.0614136	.1289309
CSR	.1789932	.2746952***	.3781259***	.094966	.0062645	-.0008463
_cons	13.88637	-8.1524	-61.29236***	1.986881	1.773769**	-16.23241***

*p-value 90%, **p-value 95%, ***p-value 99%

Source: Developed by the authors.

Regression models utilizing ROE as the dependent variable have comparatively lower explanatory power across regions, with sustainability-related variables displaying limited and region-specific statistical significance (see Table 3). In the European sample, several ESG indicators show significant relationships with ROE. The GPS showed a negative and statistically significant association ($p < 0.05$), while EPS and CSR showed positive significant relationships. In other regions, ESG indicators generally demonstrated weaker or inconsistent effects on ROE. Even in the US, where coefficients for variables such as B_S and EPS appeared relatively large, the presence of high standard errors resulted in non-significant t-values.

Collectively, these findings suggest that ROE may be inherently less responsive to ESG factors than to ROA. This discrepancy could be attributed to structural differences in equity financing and capital markets, which may dilute the immediate financial visibility of sustainability initiatives, whereas ROA more directly captures improvements in asset efficiency.

Table 3. Regression Results with ROE as the Dependent Variable.

	LA (0)	EU (1)	US (2)	ASIA (3)	AFRICA (4)	OCEANIA (5)
ROE	Coef. Robust					
B_S	-0.205351	0.0625968	3,681,943	-0.0072555	0.0073845	0.0216162
EPS	0.4309159	0.4076197**	1,278,424	0.3862829	-0.1450348	0.352618**
SPS	0.2169277	0.0908262	-2,326,548	-0.1546489	0.0318674	0.0524985
GPS	117,376	-0.7452368**	2,863,765	-0.2373375	0.4401282*	0.2387261
CSR	-0.498431	0.3962471**	1,158,525	0.3849034	0.0952646	0.023538
_cons	-38.69953	-15.94062	-634.7166	-9.794889	-15.78023	-32.69034**

*p-value 90%, **p-value 95%, ***p-value 99%

Source: Developed by the authors.

The analysis of Working Capital reveals more pronounced and region-specific associations with ESG variables (see Table 4). In the US, both B_S and the SPS displayed strong positive and statistically significant relationships with working capital ($p < 0.01$). The EPS, in contrast, showed a negative (though statistically non-significant) coefficient. These results suggest that, while financial robustness and social engagement may enhance liquidity and short-term operational efficiency, environmental initiatives could impose initial financial burdens that temporarily constrain working capital.

In the African context, both the EPS and the SPS showed statistically significant relationships with working capital. EPS exerted a negative effect, whereas the SPS contributed positively, indicating a dual dynamic in which social investments promote operational gains while environmental initiatives entail short-term financial trade-offs. This pattern may reflect the financial constraints commonly faced by firms operating in emerging markets, where sustainability investments must be carefully balanced with liquidity needs.

Similarly, in Oceania, the SPS exerted a positive and statistically significant influence on working capital, suggesting that socially responsible practices contributed to improved operational efficiency and cash flow management in this regional context.

Conversely, in LA, Europe, and Asia, ESG-related variables showed weaker or non-significant associations with working capital. This regional inconsistency may reflect structural differences in financial systems and regulatory frameworks, as well as the extent to which sustainability practices are integrated into firms' operational processes. The relationship between ESG performance and working capital management thus seems highly context-dependent across different economic environments.

Table 4. Regression Results with Working Capital as the Dependent Variable.

	LA (0)	EU (1)	US (2)	ASIA (3)	AFRICA (4)	OCEANIA (5)
WK	Coef. Robust					
B_S	686323.4	-597567.9	683854.9***	-342683.3	-28774.99	-239235.9
EPS	-5294801	-5976042	-1625095	-2289744	-4541162**	712201.1
SPS	2.81E+07	5570061	3963184***	-2019858	4060772**	2864399**
GPS	2091129	6257773	420896	1001370	1081561	367745.8
CSR	-2.07E+07	197834.2	-389815.4	686295.6	-168152.8	820736.3
_cons	-2.42E+08	-1.08E+08	-9.06E+07***	2.64E+08**	2090999	-8.78E+07**

*p-value 90%, **p-value 95%, ***p-value 99%

Source: Developed by the authors.

The analysis of revenue in relation to ESG variables (see Table 5) reveals substantial regional variation in the significance and direction of associations.

In Europe, most ESG indicators included in the model did not exert statistically significant effects on revenue. The GPS, however, shows a negative and statistically significant relationship with revenue ($p < 0.05$), suggesting that governance-related investments may involve short-term administrative or compliance costs that affect revenue performance. The remaining ESG variables—including the EPS, SPS, and CSR—did not show statistically significant associations.

The US sample, in contrast, revealed a more pronounced link between environmental and social performance and revenue outcomes. More specifically, both the EPS and the SPS exerted positive and statistically significant effects on revenue, suggesting that firms with stronger sustainability performance may benefit from reputational advantages and increased market opportunities. In this context, governance and CSR indicators do not present statistically significant relationships.

In Asia, none of the ESG components or control variables achieved statistical significance. The wide confidence intervals and high p-values indicate a lack of robust associations between sustainability practices and revenue, underscoring the limited explanatory power of these variables in this regional context.

By contrast, Africa showed mixed but substantial relationships between ESG indicators and revenue. The GPS showed a strong positive and statistically significant association with revenue, whereas CSR showed a significant negative relationship. These results may reflect the dual nature of sustainability strategies in emerging markets, where governance improvements may enhance firm credibility and market access, while certain CSR initiatives involve short-term financial costs.

In Oceania, the GPS and CSR indicators showed positive and statistically significant associations with revenue, suggesting that strong governance frameworks and socially responsible practices contribute to enhanced market reputation and revenue potential. Additionally, B_S had a negative and statistically significant coefficient, indicating that larger firms in this region experience different revenue dynamics than smaller firms.

Overall, these findings highlight the heterogeneous nature of ESG–revenue relationships across regions, emphasizing the importance of context-specific factors when evaluating the financial implications of sustainability practices.

Table 5. Regression Results with Revenue as the Dependent Variable.

	EU (1)	US (2)	ASIA (3)	AFRICA (4)	OCEANIA (5)
Revenues	Coef. Robust				
B_S	585111.8	-538578.2	-292964.7	-232188.2	-2363824**
EPS	1397420	1.82E+07**	-1.97E+07	4512826	1910658
SPS	1665100	1.20E+07**	1281554	7577456	7979747
GPS	-1670167**	-5405843	-2.34E+07	7071752***	1.18E+07**
CSR	3137885	4796025	1682538	-6677704	1.08E+07**
_cons	1.77E+07	-7.12E+07	2.33E+09	2.62E+07***	-6.34E+08***

*p-value 90%, **p-value 95%, ***p-value 99%

Source: Developed by the authors.

Overall, the empirical findings show that ESG practices influence SMEs' financial performance in different ways, depending on both the financial indicator considered and the regional context in which firms operate. Among the measures examined, ROA is the financial indicator most consistently associated with sustainability performance. Significant positive relationships were observed particularly in the US and

Europe, where governance and CSR dimensions appear to enhance asset efficiency, although social initiatives may generate short-term trade-offs, as reflected in the negative association between the SPS and ROA in the US.

ROE, in contrast, shows comparatively weaker and less consistent relationships with ESG indicators. The limited number of statistically significant coefficients suggests that sustainability investments are not immediately reflected in equity-based profitability measures, likely due to the influence of capital structure dynamics and market expectations that dilute the short-term financial visibility of ESG initiatives.

Operational indicators reveal additional nuances. Working Capital appears more responsive to certain ESG dimensions, particularly social and governance practices, which are associated with improved liquidity management in regions such as the US, Africa, and Oceania. Environmental initiatives occasionally showed negative short-term effects on liquidity, however, indicating potential investment trade-offs in the early stages of sustainability adoption.

Similarly, revenue outcomes demonstrated considerable regional heterogeneity. Positive associations between ESG pillars and revenue generation were especially evident in the US, Africa, and Oceania, where environmental, governance, and CSR practices appear to strengthen market reputation and access to new opportunities. The European and Asian samples, in contrast, showed weaker or non-significant relationships, suggesting that institutional contexts and market maturity shape the extent to which sustainability initiatives translate into revenue growth.

Taken together, these results indicate that ESG integration can enhance SME performance primarily through improvements in operational efficiency and asset utilization rather than through immediate gains in equity returns. Moreover, the findings highlight the importance of regional institutional environments in shaping the financial implications of sustainability strategies, reinforcing the notion that the relationship between ESG performance and firm outcomes remains strongly context-dependent.

5. Discussion of results

This study investigated the influence of ESG related pillars (Environmental, Social, Governance, and CSR) and Business Size on SMEs financial outcomes—ROA, ROE, Working Capital, and Revenue—across continents. The findings reveal significant regional heterogeneity, echoing themes in recent literature.

In the US, higher Governance scores and CSR engagement were significantly associated with improved ROA. In the European context, however, the relationship was more complex, as CSR showed a positive association with ROA while governance indicators had a negative effect. These results align with recent studies demonstrating that governance mechanisms and socially responsible initiatives enhance asset efficiency by promoting transparency and stakeholder trust (López-Arceiz et al., 2018). The negative impact of Social scores on ROA in the US suggests that social investments impose short term costs, consistent with theories on ESG trade offs (Yoon et al., 2024). By contrast, LA, Asia, Africa, and Oceania did not exhibit statistically significant associations. This result echoes prior findings that ESG–ROA linkages are often weak or inconsistent among SMEs in these regions, possibly due to institutional constraints or smaller ESG budgets (Garrido-Ruso et al., 2024).

Hypothesis 1—which posits that SMEs with higher sustainability scores have higher levels of ROA—is thus partially supported by the evidence presented. The statistically significant positive relationships observed especially in the US, where governance and CSR indicators positively influence ROA, lend support to this assertion. In the European context, however, the relationship appears more nuanced, as CSR demonstrates a positive association with ROA, while governance indicators show a negative effect. These findings align with prior research suggesting that specific ESG dimensions, especially governance quality and CSR, can enhance asset efficiency through improved transparency, stakeholder trust, and operational effectiveness (Kyeré & Ausloos, 2021). The results thus suggest that sustainability-oriented strategies contribute to improved asset utilization among SMEs, although these strategies' impact appears to vary across regional institutional contexts.

Across continents, ESG indicators and Business Size show limited explanatory power for ROE. This outcome supports meta-analyses suggesting that ESG impacts on equity returns are often muted, as profitability effects may be offset by leverage structures and market expectations (Orlitzky et al., 2003). The negative relationship between governance scores and ROE in Europe is also consistent with studies such as Ponomareva et al. (2022) and Faleye et al. (2011), which argue that governance investments may temporarily reduce equity returns due to the short-term costs associated with implementing compliance and oversight mechanisms.

Considering these results, the empirical evidence does not support Hypothesis 2, which postulates that SMEs with higher sustainability scores have higher levels of ROE. Across regions, ESG indicators and Business Size showed weak explanatory power for ROE, suggesting that sustainability performance may not immediately translate into improvements in equity-based financial returns (Zhao & Murrell, 2022).

In the case of Working Capital, the US and Africa demonstrated distinct patterns. Business Size and SPSs were positively associated with Working Capital in the US, whereas the EPS showed a negative (though statistically nonsignificant) coefficient, suggesting that environmental initiatives might temporarily constrain liquidity. This result resonates with evidence from Habib et al. (2024), who reported trade-offs between environmental investments and working capital among SMEs. In Africa, negative EPS and positive SPS coefficients indicate that environmental investments may reduce operational liquidity, while social initiatives appear to support it. These results echo findings by Beck and Cull (2014), who highlight capital constraints

among SMEs in the region. In Oceania, the positive and statistically significant effect of SPS on Working Capital suggests that socially responsible practices can enhance cash flows when integrated effectively (Garrido-Ruso et al., 2024).

The results provide partial support for Hypothesis 3. In regions such as the US and Africa, sustainability indicators—particularly SPSs—are positively associated with Working Capital, suggesting that responsible practices enhance short-term liquidity and operational efficiency. The negative relationship observed for Environmental scores points, however, to potential trade-offs due to the initial costs of environmental initiatives. In Oceania, the positive impact of social performance further supports this interpretation. Nevertheless, the absence of significant effects in LA, Europe, and Asia indicates that the relationship remains regionally contingent rather than universally consistent.

Finally, as to revenue outcomes, Africa emerges as a distinctive case within the analysis. Governance-related indicators showed strong and statistically significant associations with revenue, while CSR had a significant negative effect, suggesting the presence of short-term trade-offs between sustainability investments and financial performance. This dual dynamic reflects the complex balance between ESG effectiveness and the resource commitments required to implement sustainability initiatives in emerging markets (Owusu et al., 2024).

In the US, a significant positive relationship between the EPS and revenue suggests that environmental performance fosters revenue growth through reputational advantages and improved market positioning (Nguyen & Adomako, 2021). Similarly, in Oceania, governance and CSR indicators were positively and significantly associated with revenue, reinforcing the literature suggesting that strong governance structures and socially responsible practices enhance consumer trust and brand reputation (Arli et al., 2019). Europe and Asia, in contrast, do not show statistically significant ESG–revenue relationships, a result consistent with previous studies indicating that the financial benefits of sustainability initiatives depend on institutional contexts and market maturity (DasGupta & Roy, 2023).

Taken together, these findings provide partial support for Hypothesis 4. In regions such as Africa, the US, and Oceania, certain ESG dimensions—particularly environmental and governance indicators—show positive associations with revenue generation, suggesting that sustainability practices can contribute to improved market performance. However, the negative effect of CSR observed in Africa, as well as the absence of significant relationships in Europe and Asia, highlight the context-dependent nature of ESG–revenue dynamics and underscore the complexity of translating sustainability initiatives into immediate revenue gains.

Taken together, the evidence for Hypotheses 3 and 4 highlights the heterogeneous and context-dependent nature of ESG–performance relationships. While sustainability practices can enhance liquidity and revenue in certain regional contexts, their financial benefits are not uniform across all indicators or geographic environments. These findings suggest that the effectiveness of ESG strategies among SMEs depends not only on the sustainability dimensions implemented but also on the institutional and market conditions in which firms operate. ESG adoption should thus be interpreted as a context-sensitive strategic process rather than a universally consistent driver of financial performance. Table 6 summarizes the empirical support for the hypotheses examined in this study.

Table 6. Resume of hypotheses.

Hypothesis	Expected Relationship	Empirical Result	Support
H1	Sustainability → Higher ROA	Positive effects of governance and CSR on ROA, especially in the US and Europe	Partially supported
H2	Sustainability → Higher ROE	Limited and inconsistent relationships across regions	Not supported
H3	Sustainability → Higher Working Capital	Significant effects in the US, Africa, and Oceania; weak effects in other regions	Moderately supported
H4	Sustainability → Higher Revenue	Positive effects in Africa, US, and Oceania; no significant effects in Europe or Asia	Regionally supported

Source: Developed by the authors.

6. Conclusions and future research

The study findings highlight the context-dependent nature of ESG impacts on SMEs' financial performance across different regions. The continent-level analysis demonstrates that environmental, social, and governance strategies generate heterogeneous financial outcomes depending on institutional, economic, and regulatory conditions. More specifically, the results indicate that ROA appears to be the financial indicator most responsive to ESG performance, especially in regions such as the US and Europe, where governance and CSR practices positively influence asset efficiency. ROE, in contrast, shows little sensitivity to sustainability indicators, suggesting that ESG investments may not immediately translate into equity-based financial returns.

Similarly, the effects of ESG practices on Working Capital and Revenue reveal substantial regional variation. Social and governance dimensions appear to contribute positively to working capital management in certain contexts, especially the US, Africa, and Oceania, while environmental initiatives may temporarily

constrain liquidity due to the initial costs associated with sustainability investments. The results for revenue generation indicate stronger positive associations in Africa, the US, and Oceania, whereas the relationship remains weak or statistically insignificant in Europe and Asia. These findings collectively reinforce the notion that the financial implications of sustainability initiatives among SMEs are neither universal nor uniform but instead depend on the institutional environment and the specific ESG dimensions adopted.

This study therefore enriches the ESG-SME literature by providing empirical evidence of the variability and complexity of the sustainability-performance relationship across continents. For instance, SMEs operating in Africa appear to derive stronger benefits from pillar-specific ESG investments, while environmental initiatives in the US seem to generate the most visible revenue outcomes. In LA, however, the analysis remains constrained by the scarcity and fragmentation of sustainability data, which limits comparability across regions and restricts the robustness of regression models.

From a managerial perspective, the findings underscore the need for tailored sustainability strategies for SMEs operating in diverse institutional contexts. Executives should be aware of potential short-term liquidity pressures when adopting ESG initiatives and plan financing mechanisms accordingly. Institutional support mechanisms, including sustainability-linked loans, capacity-building programs, and ESG advisory services, can play a crucial role in enabling SMEs to integrate sustainability practices effectively. Policymakers are also encouraged to design context-sensitive regulatory and financial instruments that can address information asymmetries and institutional weaknesses to facilitate broader ESG adoption among smaller firms.

This study also contributes theoretically to the field of sustainability and management studies by addressing a critical gap in the ESG-SME literature, especially in emerging economies where empirical evidence remains scarce (Zhou et al., 2020). The results challenge the universal applicability of ESG frameworks, emphasizing the need for geographically nuanced analytical models that can capture institutional heterogeneity. The diversity in regional definitions of SMEs further reinforces the contextual nature of ESG outcomes. What constitutes a “small” or “medium-sized” enterprise varies considerably across the EU, the US, LA, Asia, and Africa in terms of employee thresholds, turnover, and capital requirements. These definitional differences create substantial variations in firms’ resources and constraints when implementing sustainability strategies, complicating cross-continental comparisons and limiting generalizability of empirical findings.

Ultimately, this investigation highlights the dual relevance of ESG practices as both a scholarly concern and a managerial imperative. By revealing the contingent nature of ESG outcomes and the institutional factors shaping them, the study provides actionable insights for SME managers, financial institutions, and policymakers seeking to foster sustainable and competitive economic systems. In doing so, the study advances the intellectual boundaries of ESG scholarship while supporting development of more resilient and inclusive business ecosystems.

Future research should extend these findings by employing longitudinal and panel data methodologies that can capture the dynamic and cumulative effects of ESG implementation over time. Such approaches would help to overcome the limitations of cross-sectional designs and strengthen causal inference on the ESG-performance relationship. Scholars are also encouraged to explore potential non-linearities and threshold effects, examining whether the financial benefits of sustainability investments emerge only after firms reach certain levels of ESG engagement.

Another promising avenue for research involves addressing the persistent scarcity and fragmentation of ESG-related data, particularly in LA and other emerging economies. The absence of harmonized sustainability disclosure frameworks not only limits comparability across regions but also constrains the development of robust empirical models. Advancing knowledge in this area requires the establishment of standardized and context-sensitive reporting mechanisms capable of improving transparency while reflecting institutional specificities.

From a methodological standpoint, qualitative and mixed-methods approaches may complement quantitative analyses by providing deeper insights into how SMEs integrate ESG principles under conditions of resource scarcity. Such approaches could illuminate the role of organizational culture, managerial perceptions, and informal practices, which remain underexplored yet are critical to sustainability outcomes. Comparative cross-continental research would further enrich the literature by clarifying how different socio-economic environments shape the effectiveness of ESG initiatives.

Finally, future studies should incorporate more extensive robustness checks, including alternative model specifications, sub-sample analyses, and additional firm-level controls such as leverage, industry affiliation, and capital structure. These methodological refinements would strengthen reliability and generalizability of the empirical findings while advancing the broader debate on the role of ESG practices in shaping SME performance and sustainable economic development.

Despite these research opportunities, this study is not without limitations. The cross-sectional design restricts causal interpretation and prevents analysis of temporal dynamics in ESG implementation. Furthermore, definitional heterogeneity in SME classification across regions introduces structural differences that limit strict comparability. Although continent segmentation partially mitigates this concern, future research employing harmonized panel datasets would enable stronger causal inference and dynamic modelling.

Conflict of interest

The authors declare no conflict of interest.

Declaration of authors' contribution

Raquel Pérez Estébanez: formal analysis, data curation, writing – review & editing.

Daniela Almaguer González: conceptualization, methodology, research, visualization, writing – original draft, writing – review & editing, project administration.

Data availability

The data supporting the study findings have restricted access and are not publicly available. The authors will make the data available to interested readers on request.

Declaration of generative AI use

In preparing this paper, the authors used ChatGPT (OpenAI) for grammatical and linguistic review of the manuscript and for formal review and organization of the sources and bibliographic references. After using this tool, the authors reviewed and edited the content as needed. They assume full responsibility for the content of this publication.

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