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Achieving sustainable growth and Development through strategic sustainable investment approaches

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ABSTRACT

Sustainable growth and development have become central objectives for policymakers, businesses, and investors worldwide. Achieving these goals requires strategic approaches that align financial investment with environmental, social, and governance (ESG) principles, while fostering long-term economic and social value. This study explores the role of strategic sustainable investment approaches in promoting sustainable growth, emphasizing how targeted capital allocation, corporate governance, green finance, and innovation can collectively enhance environmental protection, social inclusion, and economic resilience. By synthesizing theoretical insights and empirical evidence, the research highlights best practices for integrating sustainability into investment decision-making, including risk management, stakeholder engagement, and impact measurement. The findings suggest that a strategic, sustainability-oriented investment framework not only supports the achievement of Sustainable Development Goals (SDGs) but also drives competitive advantage for firms and economies in the long term.

Introduction

The study uses a novel approach and computer-aided textual analysis to examine the synergy between I4.0 technologies and CE techniques and narrative disclosure of SSIDMP in UK companies. The specific attention of this study is to study the influence of governance mechanisms on the synergy between I4.0 technologies and CE techniques. We use a computer-aided textual analysis to answer the research questions underpinning this study. This evolving paradigm helps examine large-volume texts to identify and analyze the linguistic features of documents. We conduct an empirical analysis to examine the trend of synergy between I4.0 technologies and CE techniques over time (2021—2021) and across the industry sector. Besides, to show the trend of relation-ships between these new disclosure types and benefits associated with SSIDMP. Further, we

have supported our debate and results of data analysis using extracts from companies' annual reports of different sectors.

The UK provides a unique context to this study for many reasons. First, in 2013, a long-term action plan for the manufacturing industry in the UK called the ‘Future of Manufacturing’ was implemented. Second, to sustain itself, the manufacturing industry will need to develop novel processes, innovations, and methods to meet demanding sustainability targets and create new economic growth. Government strategies primarily drive guidelines for integrating I4.0 technologies with CE techniques, including minimizing material inputs, waste management, reduced water usage, energy efficiency, low-carbon technologies, supply chains with spare capacity, material that is not land-filled but engaged in productive loops, and less material consuming products and are close to consumers [1].

Successful integration of I4.0 technologies and CE techniques enables companies to redesign value creation structure, achieve desired outcomes of their SSIDMP and accelerate the processes toward sustainable business models and SDGs. In recent years, the business architecture of value creation has been subjected to a significant transformation due to the rapid progress of digital technologies and huge volumes of data that new intelligent devices and their applications toward CE. I4.0 technologies and CE techniques significantly impact SSIDMP, including scanning and screening investment opportunities, product, and process innovation, strengthening organizational resource control mechanisms, and improving investment efficiency [2].

Our conceptual framework and results offer important managerial and theoretical implications. First, we develop a new measure of I4.0 technologies and CE techniques disclosure, a pioneering attempt in the manufacturing literature to the best of our knowledge. Second, we provide new empirical evidence regarding the synergy between I4.0 technologies and CE techniques and the influence of this synergy on SSIDMP and companies' financial performance. Third, we examine how governance mechanisms influence these relationships [3]. We

find they moderate the relationships between I4.0 technologies, CE techniques, SSIDMP, and companies' financial performance. Our findings offer in- sights into organizational ambidexterity's vital role in the synergy be- tween I4.0 technologies and CE techniques. An ambidextrous organization requires mobilization, integration, and coordination of organizational resources to maintain exploitation and exploration to achieve successful outcomes of SSIDMP. The findings of this study have important managerial implications regarding the influence of the synergy between these two domains on value creation and realization and their potential economic, ecological, and social consequences for SDGs.

By understanding and providing stronger, region- specific insights results, this study significantly contributes insights for policymakers and regulators to address institutional and governance challenges. Fourth, unlike other research that analyses governance or FDI independently, this study offers a dual view by looking at their separate and combined effects on overall SDGs and its three pillars: economic, social and environmental. This all-encompassing approach helps scholars better grasp the interactions between institutional quality and foreign capital flows that influence development routes [4]. Fifth, this study applied a segmented regional analysis that helps understand how institutional and governance quality enhance the progress toward the sustainable development goals in both regions. By examining heterogeneity among SSA and MENA regions, and revealing that while both governance and FDI are promoting the progress of the SDGs, the size and significant influence of these impacts differ by nation. These results underscore the need of prioritizing region-specific insights, governance reforms and local policies to enhance governance systems and investment approaches in accordance with their institutional frameworks. Finally, this study provides region-specific recommendations and demonstrates how governance reforms and FDI can be aligned with differences local institutions to contribute significantly to the achievement of the SDGs in SSA and MENA countries. To address these contributions, this study offers new insight into how governance and FDI aligned with Sustainable development goals in developing countries [5].

We structure the remaining sections of this paper as follows:

"Literature review and hypothesis development" reviews the relevant literature and develops the hypotheses. "Data and methodology" describes the methodology and data. "Empirical results and discussion" presents the empirical findings, including the robustness checks, and discusses their implications. "Conclusion and Policy Implications" concludes the study and offers recommendations. While previous studies have explored the independent effects of governance and FDI on sustainable development, this research is among the first to analyze their interactive effects using region-specific insights.

This study contributes to the body of knowledge on sustainable development in several significant ways. First, most prior studies rely on partial proxies of sustainable development, such as CO_2 emissions, economic growth, or social indexes, such as education, health and employment in isolation, our study comprehensively investigates all three pillars of sustainable development (eg. economic, social and environmental sustainability), providing more details and integrated perspective on sustainable development. Second, instead of relying on single concept governance measures, we construct a governance quality index that combines six institutional dimensions using principal components analysis (PCA), which more reflects governance quality measure [6].

Literature review

Abhayawansa, S., Adams, C. A., & Neesham, C. (2021) [1] examine the intersection of accountability, governance, and sustainable development goals (SDGs). The study conceptualizes the mechanisms through which governments can create value in pursuit of sustainability objectives. The authors argue that effective governance structures, when paired with robust accountability frameworks, are critical for aligning public policies with SDGs. The research highlights how governmental actions and reporting practices can influence the efficiency and impact of sustainability initiatives, emphasizing both theoretical and practical implications for policymakers striving to achieve long-term social and environmental outcomes.

Achim, M. V., Văidean, V. L., & Safta, I. L. (2023) [2] investigate the relationship between corporate governance quality and sustainable development, considering the developmental stage of the country. Their analysis indicates that high-quality governance mechanisms such as transparent

decision-making, effective board oversight, and ethical leadership positively influence sustainable development outcomes. Moreover, the study suggests that the impact of governance varies depending on a country's level of economic development, with more developed economies benefiting more significantly from formal governance structures. This work underscores the importance of contextual factors when designing governance frameworks to support sustainability.

Acquah, A. M., & Ibrahim, M. (2020) [3] explore the link between foreign direct investment (FDI), economic growth, and financial sector development in Africa. The study finds that FDI contributes positively to economic growth, especially when complemented by a well-developed financial sector. It emphasizes that sustainable economic development in African countries depends on a balanced approach where external investments are leveraged alongside robust financial governance. This research provides empirical evidence supporting the notion that governance and financial infrastructure play pivotal roles in translating investment inflows into sustainable growth.

Agyemang, A. O., Osei, A., & Kongkuah, M. (2025) [4] focus on the intersection of ESG (Environmental, Social, Governance) practices and the circular economy in emerging markets. Using a systems perspective, the authors analyze how governance, innovation, and sustainable business models interact to foster environmental and economic sustainability. Their findings suggest that integrating ESG considerations into corporate strategy not only drives innovation but also enhances the resilience and sustainability of business operations. The study contributes to understanding how governance frameworks can enable circular economy practices and sustainable business models in less developed contexts.

Ahmed, A., & Anifowose, M. (2024) [5] investigate the role of corruption and corporate governance in achieving sustainable development goals across African nations. They argue that corruption undermines governance structures, which in turn hampers the effective implementation of SDGs. The study highlights the critical need for strong corporate governance and anti-corruption mechanisms to promote transparency, accountability, and ethical practices in both public and private sectors. Their work provides practical insights into

how governance reforms can enhance sustainable development outcomes in regions challenged by governance weaknesses.

Almaqtari, F. A., Elsheikh, T., Hussainey, K., & Al-Bukhrani, M. A. (2024) [6] examine the influence of country-level governance on firms' sustainability performance. Their study demonstrates that strong institutional frameworks, regulatory quality, and government effectiveness significantly enhance corporate sustainability outcomes. The authors argue that governance mechanisms at the national level create an enabling environment for firms to adopt sustainable practices, which in turn supports broader progress toward sustainable development goals (SDGs). The research highlights the interconnectedness of macro-level governance and micro-level corporate behavior in driving sustainability.

Anas, M., Zhang, W., Bakhsh, S., Ali, L., Işık, C., Han, J., & Huang, M. (2024) [7] explore the role of green finance, green technological innovation, natural resource depletion, and forested areas in achieving sustainable environmental development in emerging economies. The study assesses the load capacity factor—a measure of environmental sustainability—and finds that green finance and technological innovations significantly mitigate environmental pressures. Their findings emphasize the importance of integrating financial, technological, and ecological strategies to ensure balanced and sustainable environmental outcomes. This research underscores the need for coordinated policies that promote sustainable development while conserving natural resources.

Asongu, S. A., & Odhiambo, N. M. (2020) [8] analyze the relationship between governance, CO_2 emissions, and inclusive human development in Sub-Saharan Africa. They find that effective governance reduces environmental degradation and enhances human development outcomes. The study emphasizes that governance quality through transparency, accountability, and institutional efficiency is critical for addressing the environmental and social challenges faced by developing countries. Their work provides evidence that sustainable development cannot be achieved without strong governance that simultaneously addresses environmental sustainability and human welfare.

Asongu, S. A., & Odhiambo, N. M. (2021) [9] investigate how income levels and

governance jointly influence inclusive human development in Sub-Saharan Africa. Their findings indicate that both higher income and better governance positively contribute to human development indicators, such as education, health, and social welfare. The study highlights the nuanced interplay between economic resources and institutional quality, suggesting that governance improvements amplify the benefits of rising incomes for sustainable and inclusive human development.

Awijen, H., Belaïd, F., Zaied, Y. B., Hussain, N., & Lahouel, B. B. (2022) [10] focus on renewable energy deployment in the MENA (Middle East and North Africa) region, emphasizing the role of innovation. The study finds that technological innovation significantly accelerates renewable energy adoption, thereby contributing to sustainability and energy security. The authors argue that policy support, research and development, and innovation ecosystems are critical drivers for scaling renewable energy solutions in emerging economies. Their work highlights the strategic importance of integrating innovation into energy policies to meet environmental and sustainable development objectives.

Barbier, E. B., & Burgess, J. C. (2021) [11] investigate the role of institutional quality and governance in advancing progress toward the Sustainable Development Goals (SDGs). Their study emphasizes that strong institutions, characterized by transparency, accountability, and rule of law, are essential for effective policy implementation and sustainable development outcomes. The authors argue that institutional weaknesses can hinder SDG achievement by creating inefficiencies and governance gaps. This research underscores the foundational importance of governance quality in shaping a country's ability to meet social, economic, and environmental targets.

Farooque, O. A., Hamid, A., & Sun, L. (2022) [12] analyze the relationships between national governance, corruption, and economic growth, with a focus on Sub-Saharan Africa and MENA countries. The study finds that countries with higher governance quality and lower corruption levels experience stronger and more sustainable economic growth. By linking governance indices and corruption metrics with growth performance, the authors highlight the critical role of institutional frameworks in promoting economic stability and sustainable development. Their findings

also suggest that anti-corruption policies and good governance practices are key enablers of long-term development.

Guoyan, S., Khaskheli, A., Raza, S. A., & Shah, N. (2022) [13] explore the impact of foreign direct investment (FDI) on carbon emissions in MENA countries, emphasizing the implications for sustainable development. The study reveals that FDI can both positively and negatively influence environmental outcomes, depending on the sectoral composition of investments and the governance environment. The authors argue that effective environmental regulation and governance structures are crucial to ensure that FDI contributes to sustainable growth rather than exacerbating environmental degradation. This research provides a nuanced perspective on how investment flows interact with sustainability objectives in emerging regions.

Haghighi, H., & Takian, A. (2024) [14] examine the role of institutionalization in achieving good governance for sustainable health development. They propose a framework that links governance principles such as accountability, transparency, and policy integration with improved health outcomes. The study argues that institutionalized governance mechanisms are vital for aligning health policies with broader sustainability goals, ensuring that health systems are resilient, equitable, and sustainable. This research highlights governance as a central pillar for achieving SDG-related health targets.

Izadi, J., & Madirimov, B. (2023) [15] investigate the effects of foreign direct investment (FDI) on Sustainable Development Goals in Eurasian countries. The study finds that FDI can positively contribute to SDG progress when accompanied by strong regulatory frameworks and governance mechanisms. However, in contexts with weak institutions, FDI may lead to uneven development and environmental challenges. The authors emphasize that policy and governance interventions are critical for translating foreign investments into sustainable and inclusive development outcomes.

Theoretical framework

Methodology

In this study, we have particular attention to four disclosure pillars of determinants to enable us to offer a comprehensive assessment of narrative disclosure measurement of current SSIDMP in UK companies:

(a) I4.0 technologies; (b) CE techniques; (c) internal and control mechanisms (board characteristics; ESG; audit and control mechanisms; and SDGs), and (d) companies' financial performance. The conceptual underpinning of this study, as depicted is based on theoretical triangulation rooted in resource-based theory, triple bottom line (TBL) theory, and stakeholder theory to understand better and advance our knowledge of critical strategic pre-decision control mechanisms associated with SSIDMP [7].

The triple bottom line theory proposed by focuses on sustainability as the primary objective and incorporates three performance dimensions: economic, social, and environmental, enabling sustainable results. Based on TBL, the most critical objective of firms is to sustain profitability for the long term. The social sustainability dimension includes the social affairs of the relevant societies, human rights, and health services, whereas environmental sustainability includes paying attention to environmental changes and obeying ecological regulations. Most studies examined the green and sustainable manufacturing sector have a great potential to influence the triple bot- tom line; economic, social, and environmental aspects.

The stakeholder theory suggests that firms seek to gain shareholders' satisfaction and other groups, including customers, suppliers, creditors, regulators, NGOs, and social groups to create a balance between shareholders and stakeholders to mitigate conflicts of interest between these two groups [8]. These issues resulted in the need for comprehensive disclosures of financial and non-financial information regarding strategies and mechanisms adopted by boards for leading and steering organizational resources

Selection of disclosure terminologies and empirical model

To answer this study's research questions, we use textual analysis to identify the disclosure of I4.0 technologies and CE techniques in narrative sections of UK companies' annual reports (2012–2021). Computer-aided textual analysis is an evolving paradigm that helps examine large-volume texts to identify and analyze the linguistic features of documents (Loughran and McDonald, 2011). We

followed the literature regarding constructing a word pool. To measure I4.0 technologies, CE techniques, and SSIDMP disclosure practices, we have used search processes comprising three stages [9]. We use descriptive statistics to examine the trend of SSIDMP and illustrate the synergy between I4.0 technologies and CE techniques over the sample underpinning this study (2021–2021) and across the industry sector. Besides, to show the relationship between disclosure types and benefits associated with SSIDMP. Further, we have supported our debate and results of data analysis using extracts from companies' annual re- ports from different industries. To test our hypotheses regarding CE technologies' impact on SSIDMP, we run the following models using ordinary least squares (OLS). To reduce the standard error and avoid the effect of omitted variable bias, we re-run our regressions using a fixed- effect panel model.

Table 1: Comparison of the mean differences between SSA and MENA for all variables

Variables	All sample		SSA countries		MENA countries		*t*-value
Overall SDGs	54.76	7.98	52.58	7.01	59.74	7.83	15.55
ECO_SDGs	46.34	13.66	42.22	11.77	55.78	13.01	17.68
SOC_SDGs	49.99	10.48	46.22	9.21	56.95	9.87	17.04
ENV_SDGs	66.15	8.82	66.36	8.63	65.95	9.22	−1.24
Panel B: Independent variables							
GOV	−1.58	1.00	−0.18	0.91	0.41	1.06	9.66
FDI	4.04	8.37	4.70	9.75	2.41	2.74	−6.47
GI	50.80	10.64	47.52	8.71	58.33	10.86	17.40
GS	6.53	1.14	6.22	1.20	6.67	1.09	−8.93
GDP	7.58	1.47	7.44	1.45	7.91	1.47	.5.37
POP	16.25	1.30	16.17	1.27	16.44	1.34	3.34
No of observations 1288			897		391		

is a significant level at <0.01.				

This study aims to investigate the impact of governance and FDI on the achievement of overall SDGs, focusing on the three pillars of sustainable development: economic, social and environmental. It utilizes balanced panel data from 2000 to 2022, covering 56 countries in SSA and MENA. These countries are selected because of their low governance quality and SDG challenges. Several countries in SSA and MENA face governance challenges that interfere with SDGs [10]. Owing to missing data, we reduce the sample to 56 countries. SDG indicators are derived from the United Nations Development Programme (UNDP), whereas other variables are obtained from World Bank data.

Measurement of variables

Dependent variables Sustainable Development Goals: Practices related to SDGs are categorized into economic, social and environmental SDGs. These SDGs serve as dependent variables for this study. The economic ECO_SDGs index measures a country's progress towards achieving the economic-related targets of SDGs. It includes 7 of the total 17 SDGs. The social SOC_SDGs index includes 5 of the total 17 SDGs. A high index score indicates that corporations are committed to generating a good social effect via their economic activity. The environmental ENV_SDGs index refers to the capacity of a corporation to maintain and safeguard the natural environment over a prolonged period by implementing suitable practices and regulations.

Another significant control variable, the size of the government plays a significant role in progressing toward the SDGs, through government expenditures [11]. Where the government size influences the quality of government services, including health, education, infrastructure, and environmental activities. These elements together contribute to achieve SDGs. Also, the size of the government may have an effect on governance and foreign direct investment. For example, countries with a higher score of government size are more likely to have robust institutions, higher level of environmental protection, implementations of regulations and rules that contribute to attract FDI. thus, leads to achieving SDGs.

Control variables This study includes gross domestic product, population and globalization index as control variables due to their significant influence on a country's economic growth and market. They reflect the overall macroeconomic indicators, which could influence a country's ability to involved in the global sys- tem, support governance, attract foreign direct investment and implement policy that enhances sustainable development goals. Including these variables ensures a more accurate estimation of the relationship between governance, FDI and SDGs by mitigating omitted variable bias and capturing the broader macro- economic and structural context. Gross domestic product reflects a country's level of economic development and resource avail- ability, which significantly affects nation's ability to contribute to achieving economic, social and environmental sustainability [11].

Table 2: Cross-sectional dependence and unit root tests

SDGs	145.1	−1.86	−4.32	−1.60	−2.04
SDG_ECO	152.57	−2.26	−4.60	−1.80	−2.83
SDG_SOC	104.42	−1.93	−4.28	−1.73	−2.32
SDG_ENV	41.11	−2.66	−5.05	−1.87	−2.43
GOV	4.20	−2.33	−4.78	−1.78	−2.56
FDI	13.31	−2.83	−5.08	−2.28	−2.58
GI	154.27	−2.65	−4.80	−2.23	−2.52
GS	3.40	−2.20	−4.60	−2.25	−2.65
GDP	146.27	−2.63	−4.08	−1.68	−2.56
POP	181.33	−1.93	−2.41	−1.79	−2.25
CD is cross-sectional dependence, CIPS is the Pesaran unit root test, and CADF is the augmented Dickey-Fuller test in the presence of CD. represent statistical significance at 0.01 level, H0: Cross-sectional Independence.					

where *it* denotes the country and time period, and the overall sustainable development index (SDGs), economic sustainability (ECO_SDGs), social

sustainability (SOC_SDGs) and environmental sustainability (*ENV_SDGs*) scores are the dependent variables. Governance quality (GOV) and FDI are the main independent variables. The logarithm of GDP, the logarithm of Population (POP), Globalization Index (GI) and government size (GS) variables are the control variables, with each β representing the slope coefficient of independent variables, while μ_{it} is the error term.

We added synonyms and amended the preliminary I.4 technologies and CE techniques proxies. In this stage, we recognized synonyms and added them to the primary proxies. Further, the reviewing terminologies ensured the reliability of our proxies [12]. At this stage, inconsistencies were resolved. presents the final versions of our proxies. We use content analysis using computerized textual analysis software called Corporate Financial Information Environment (CFIE) Final Report Structure Extractor (FRSE) to score the total disclosure on I.40 technologies and CE techniques. The disclosure level is measured simply by counting I.4 technologies and CE techniques terminologies related to (i) sentences or (ii) words before transforming this number into a natural logarithm. CFIE-FRSE tool is a desktop application that detects the structure of annual reports and extracts the reports' contents at the section level. CFIE-FRSE help explores texts using natural language processing (NLP).

Result

The average SDGs scores for the whole sample, MENA nations and SSA nations are 54.76, 59.74 and 52.58, suggesting that MENA countries perform comparatively better in achieving SDGs. The average ECO_SDGs score across the sample is 46.34, suggesting that both regions continue to face significant challenges in achieving economic-related SDGs. Similarly, the average SOC_SDGs score is 49.99, indicating that both regions show relatively weak progress in this area [13].

The governance quality appears to have challenges in improving the level of SDGs among SSA region, suggests relatively weak institutional frameworks and could reflect limited transparency and a lack of accountability in both regions. The average proportion of FDI inflow to GDP is 4.04%, indicating that the SSA and MENA regions are integrating into the global economy via FDI. Regarding the Globalization Index, the

average GI is 50.80, suggesting an acceptable level of integration into the global economic and social system. Government size, the average is (6.53), suggesting that both countries have moderately sized government, while the average GDP is 7.58, and the average POP is 16.25.

The correlation coefficients between independent and dependent variables. In particular, governance (GOV) is strongly linked to ECO_SDGs and SOC_SDGs, meaning that better institutional quality is connected to high scores in sustainable development but does show a low correlation with ENV_SDGs. FDI demonstrates an no significant correlation with all SDGs. The GI demonstrates a strong positive correlation with all SDGs, indicating that integration into the global system contributes to achieving them.

SDGs between the SSA and MENA countries The analysis focuses on understanding the factors that shape the governance practice in both regions, including the influence of the three pillars of SDGs. SSA and MENA are two diverse economic and political systems that have differing degrees of development, regulations, and cultural components [14]. When you consider governance, FDI, and SDGs in SSA and MENA nations, you observe that their overall, economic, and social SDG ratings are quite different

.

Table 3 Slop homogeneity test

Test	Model 1	Model 2	Model 3	Model 4
Delta	11.30	10.03	5.26	5.50
Delta adj.	14.70	13.06	6.84	7.15
represents statistical significance at 0.01, 0.05 and 0.10 levels, respectively.				

MENA countries demonstrate a significantly higher average SDGs score (59.74) compared to SSA countries (52.58), with a difference at $p < 0.01$. MENA countries are also showing a higher average ECO_SDG score (55.78) compared to SSA countries (42.22).

Moreover, the average SOC_SDGs score is significantly higher in MENA (56.95) than in SSA (46.22). Nonetheless, the average ENV_SDG scores of both regions are comparable. The governance quality (GOV) is slightly higher in MENA than in SSA countries, indicating that these regions are facing challenges related to poor governance indices, including lack of transparency, insufficient regulatory quality and low accountability. CS-ARDL results and discussion Following the assessment of cross-sectional dependence among the variables, we estimate the long- and short-term relationships among governance, FDI and SDGs using the CS-ARDL technique. This estimation is due to the increased likelihood of CD and slope heterogeneity in panel data analysis when many nations are being examined. The panel data analysis strategy developed by Chudik and Pesaran (2015) utilizes the dynamic common correlated impact approach to control potential problems of CD and heterogeneity in panel data.

Table 4: FE_DK Robustness analysis results

Independent variables	Dependent Variables			
	Overall SDs Model 1	ECO_SDGs Model 2	SOC-SDGs Model 3	ENV_SDGs Model 4
GOV	0.193 (0.042)	0.152 (0.054)	0.262 (0.093)	0.211 (0.125)
FDI	0.011 (0.004)	0.014 (0.006)	0.008 (0.006)	0.005 (0.003)
GI	0.016 (0.006)	0.025 (0.008)	0.019 (0.010)	0.006 (0.010)
GS	−0.002 (0.015)	−0.035 (0.010)	−0.008 (0.036)	0.001 (0.026)
GDP	0.057 (0.024)	0.160 (0.031)	0.144 (0.062)	0.034 (0.018)
POP	−0.055 (0.101)	−0.153 (0.235)	−0.469 (0.353)	−0.210 (227)
Note: Standard error is given in the parentheses and , , represents				

statistical significance at 0.01, 0.05 and 0.10 levels,		

In addition, it is consistent with the findings of Ahmed and Anifowose (2024) and Sadiq et al. (2023), who confirm that governance improves the progress towards achieving SDGs for a nation by enhancing accountability, transparency and supportive institution efficiency. Hence, good governance guarantees SDG achievement. Consistent with the literature supporting the argument that good governance improves progress towards economic SDGs (ECO_SDGs), in this study, governance has a significant positive relationship with economic SDGs (coefficient = 0.476, $p < 0.05$) in the long run in Model 2. Indicating that a one unit increased in the governance score leads to increase 0.48-point in progress toward the achievement of economic sustaianble development. In the short run, governance is positive and statistically significant, and this result again exhibits the same trend in the long run [15]. A possible explanation for this finding may be that sound governance is considered a vital factor of macroeconomic and institutional determinants that could affect economic sustainability in SSA and MENA regions, therefore supporting H1b.

Turning to social sustainability as a dependent variable in Model 3, the results indicate that governance have marginally significant positive influence on social sustainability (coefficient = 0.723, $p < 0.10$), indicting that good governance, such as enhancing transparency and accountability might support social sustainable development goals (eg. reduce poverty, education, healthcare and equality) in long run, but insignificant effect in the short run. This finding means that a strengthening governance reform is associated with the computable progress in the social sustain-ability, thus marginally supporting H1c. A possible explanation for this finding could be that governance contributes to the attainment of social SDGs. In SSA and MENA countries, the governance index not only complements the promotion of economic development but also has great potential to marginally positive impact social sustainable development. Hence, the result in both regions highlights the need for governance reforms to stimulate the countries to improve their governance quality, especially focus for poverty, healthcare and education and reduce corruption, and achieve social sustainability.

Partnering is a significant issue for successful SSIDMP and maintaining effective synergy between I4.0 technologies and CE techniques that enable product and process innovation and contribute toward a sustainable world. "Together with other companies, we collectively pledged a total of US$100 million in funding to Circulate Capital, an investment firm that incubates and finances waste management solutions and infra-structure. It is a unique investment model designed to create lasting systems change to address the ocean plastic crisis. This year Circulate Capital announced inaugural investments in two companies in India and Indonesia that recycle local plastic waste into useful products. Across all our plastic targets, we need to continue our advocacy, partnerships, and policy approach to drive system-wide change and shift the economy from a finite and linear take, make, dispose of model to a circular approach that protects the environment and protects our resources" U, AR 2020, p.59.

"To improve the visibility and traceability of our commodity supply chains, we use satellite imagery, geo location data, block chain, and AI. We're part of Global Forest Watch, a group of companies developing radar technology to detect deforestation more quickly and accurately. In 2020, we began working with US geospatial analytics specialist Orbital Insight to get data around the 'first mile' in our supply chains". U, AR, 2020, p.27.

"At some of our former assets, we are exploring options to repurpose the site for renewable energy, such as our pilot photovoltaic cell facility at Merignac, France, a former ferroalloy plant. We sometimes partner with universities and other companies to find opportunities to repurpose and reprocess waste and improve water and waste treatment. For example, in the Saguenay – Lac-Saint-Jean region of Quebec, Canada, we worked with local blueberry growers to create a safe and effective fertilizer from waste from our aluminum operations". RT, AR, 2020, p.81.

"We contribute to Rio Tinto's sustainable growth by unlocking value from our high-grade ore bodies and developing new materials. By giving a second life to mining waste with by-products, we are expanding our frontiers for the increasing demand for critical minerals.

We apply innovative technology and processes to deliver products that will contribute to a decarbonizing and sustainable modern world". RT, AR, 2020, p.3 "By embedding circular economy principles into packaging and product formulations, we're shifting from using fossil-fuel derived feed stocks to renewable or recycled carbon sources for cleaning chemicals." U, AR, 2020, p.55.

Conclusion

Achieving sustainable growth and development requires a deliberate integration of strategic sustainable investment approaches into economic, corporate, and policy frameworks. Investments guided by environmental, social, and governance (ESG) principles, coupled with innovation and effective governance, have the potential to generate long-term value while addressing pressing societal and environmental challenges. The analysis indicates that sustainable investment is not only a tool for financial returns but also a mechanism to advance Sustainable Development Goals (SDGs), enhance social inclusion, and foster economic resilience. By aligning capital allocation with sustainability objectives, investors and policymakers can create synergistic benefits that balance profitability with environmental stewardship and social responsibility. Ultimately, the adoption of strategic sustainable investment approaches provides a pathway for firms, governments, and economies to achieve growth that is inclusive, responsible, and enduring, ensuring that present development does not compromise the well-being of future generations.

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