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Digital Transformation and ESG Performance: Does MyDigital Policy Matter?

(Transformasi Digital dan Prestasi ESG: Adakah Dasar MyDigital Penting?)

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ABSTRACT

This study investigates the associations between digital transformation and ESG performance, focusing on the strength of the relationship before and after the implementation of the national policy, MyDigital, as a moderating factor. Utilizing panel data from 1,399 firm-year observations covering the period 2015–2024, the study selects Malaysian listed firms as its sample. Both fixed effects and quantile regression models are employed to examine the impact of digital transformation on ESG performance, with MyDigital as the moderating variable. Findings reveal that digital transformation positively influences ESG performance in the fixed effect model (β=1.14). Quantile regression reveals that digital transformation significantly enhances ESG performance, with effects ranging from 3.60 at the q10 to 5.48 at the median and 4.48 at the q75. However, there is no evidence of a moderating effect in the fixed effects model, while the quantile regression shows a significant interaction between MyDigital and digital transformation that occurs only at higher ESG levels (β=2.44 at q75; β=3.76 at q90). This indicates that MyDigital does not significantly influence the direction of the relationship between digital transformation and ESG performance. The study provides valuable implications, among others that policymakers can refine existing policies, regulators may support lagging sectors in advancing ESG and digital initiatives, businesses can better align their digital transformation strategies with sustainability roadmaps, and investors can utilize the findings for ESG-informed investment decisions. This research contributes to the literature by examining national policy settings that serve as enablers in strengthening the digital transformation–ESG performance nexus.

Keywords: Digital transformation; ESG performance national policy; MyDigital; sustainability

ABSTRAK

Kajian ini menyiasat hubungan antara transformasi digital dan prestasi ESG dengan memberi tumpuan kepada kekuatan hubungan tersebut sebelum dan selepas pelaksanaan dasar nasional, MyDigital, sebagai faktor pemoderasi. Dengan menggunakan data panel daripada 1,399 pemerhatian firma-tahun yang merangkumi tempoh 2015–2024, kajian ini memilih firma tersenarai di Malaysia sebagai sampel. Model kesan tetap (fixed effects) dan regresi kuantil digunakan untuk mengkaji kesan transformasi digital terhadap prestasi ESG, dengan MyDigital sebagai pemboleh ubah pemoderasi. Dapatan kajian menunjukkan bahawa transformasi digital memberi pengaruh positif terhadap prestasi ESG dalam model kesan tetap (β = 1.14). Sementara itu, regresi kuantil menunjukkan bahawa transformasi digital meningkatkan prestasi ESG secara signifikan, dengan kesan antara 3.60 pada q10 hingga 5.48 pada median dan 4.48 pada q75. Walau bagaimanapun, tiada bukti kesan pemoderasi dalam model kesan tetap, manakala regresi kuantil menunjukkan interaksi antara MyDigital dan transformasi digital hanya signifikan pada tahap ESG yang lebih tinggi (β = 2.44 pada q75; β = 3.76 pada q90). Ini menunjukkan bahawa MyDigital tidak mempengaruhi secara signifikan arah hubungan antara transformasi digital dan prestasi ESG. Kajian ini memberikan implikasi penting, antaranya pembuat dasar boleh menambah baik dasar sedia ada, pengawal selia boleh menyokong sektor yang ketinggalan dalam memajukan inisiatif ESG dan digital, perniagaan boleh menyelaraskan strategi transformasi digital dengan pelan hala tuju kelestarian, dan pelabur boleh menggunakan dapatan ini bagi membuat keputusan pelaburan berasaskan ESG. Penyelidikan ini menyumbang kepada literatur dengan menilai sama ada penubuhan dasar nasional berfungsi sebagai pemangkin dalam mengukuhkan hubungan antara transformasi digital dan prestasi ESG.

Kata kunci: Transformasi digital; dasar prestasi ESG nasional; MyDigital; kelestarian

INTRODUCTION

More than just a checkbox to tick, the Environmental, Social and Governance (ESG) practices reflect the extent of initiatives firms undertake to combat climate change risks, meeting various stakeholders' and societal expectations besides ethical governance. Green investors, particularly, view ESG adopters as resilient businesses that have innovative capabilities in a world shaped by sustainability requirements. The real differentiator in the market lies in firms that embed ESG as a central component of long-term goals, converting risks and challenges into competitiveness against peers (Eliwa et al. 2021). The argument supported by Tron et al. (2025) revealing corporate strategies enriched with ESG criteria enhance competitiveness by reducing cost of debt ultimately signaling the financiers willing to offer attractive terms (Tron et al. 2025). The consequences not only enhance their reputation but potentially have improvement in their financial performance (Atan et al. 2018) and regulatory compliance.

Digital transformation involves innovation and optimizing traditional business practice by integrating digital technology into all business processes (Cetindamar & Abedin 2020; Nizam et al. 2025). The adoption of digital technologies alters the existing workflow and leadership dynamics, signaling a transition in managing human capital to adapt with the technology-driven environment (Schwarzmüller et al. 2018). Aligning digital transformation strategies with overall business strategies is a central theme to ensure that every investment in digital advancement can be effectively translated into value creation for the firms. Firms, not wanting to be left behind, are also adopting digital transformation initiatives that benefit from reduced operational costs while enhancing efficiency, thus supporting their strategic objectives in maximizing profitability (Fuxia et al. 2022).

In the Malaysian context, the government introduced the Malaysia Digital Economy Blueprint (MyDigital) in 2021 as a national digital transformation initiative aimed at accelerating the development of Malaysia's digital economy. The policy seeks to promote digital adoption across industries, strengthen digital infrastructure, enhance data governance, and encourage the integration of advanced technologies such as artificial intelligence, cloud computing, and big data analytics. Through this comprehensive framework, MyDigital aims to establish a digitally enabled ecosystem that fosters innovation, transparency, and sustainable development. By encouraging firms to adopt digital technologies and improve digital governance, the initiative has the potential to indirectly support ESG-related outcomes, particularly in areas such as environmental monitoring, transparent reporting, and responsible business practices.

While existing studies increasingly emphasize the impact of digital transformation on ESG performance (Ji et al. 2023; Kwiliński et al. 2023; Korankye et al. 2025; Li et al. 2025), research in this area is still limited, particularly in the context of emerging economies such as Malaysia. In addition, the effectiveness of MyDigital as a national-level policy in accelerating digital technology advancements across sectors to enhance sustainability reporting, transparency and environmental sustainability remains underexplored. Existing literature on digital transformation and ESG performance rely on global data, leaving a gap for Malaysia whereby the adoption of technology advancements and sustainability practices is still at a growing phase. This study pioneers in filling this gap in understanding the impact of digital transformation on ESG performance within the context of the national digital agenda in emerging economies. By analyzing data over the period 2015 to 2024 covering both pre- and post- MyDigital establishment, the study seeks to capture whether the moderating effects of MyDigital, as a national guideline, can amplify or weaken the effectiveness of digital transformation to improve ESG performance. The study provides insights for policymakers to refine existing digital policies in enhancing sustainability practices. For regulators, the study findings guide them in supporting lagging sectors through incentives or programs that can accelerate the adoption of ESG and digital initiatives. Practitioners can align digital transformation strategies with sustainability roadmap for better resource allocation and ESG disclosure improvement. Meanwhile, investors can leverage the findings to make informed ESG investment decisions by evaluating the integration of digital advancements with sustainability practices for risk assessment and long-term value creation.

The remaining parts of the paper are arranged as follows: Section 2 presents theoretical framework, literature review and hypotheses. Section 3 outlines the research methodology, Section 4 outlines the empirical results, Section 5 discusses the findings, and finally, Section 6 concludes the study with limitations and suggestions for future research.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

THEORETICAL FRAMEWORK

The study employs Resource-Based View (RBV) to describe the impact of digital transformation on ESG performance with the presence of MyDigital policies within Malaysian listed companies. Firms possess unique resources that are valuable, rare, distinct, and non-substitutability (Barney 1991) to be different from their counterparts. Digital capabilities are among the common resources that enable firms to create distinctive and valuable digital products (Egala et al. 2024) and act as differentiators by embedding sustainability into business operations (Martínez-Peláez et al. 2023). From a firms' perspective, the revolution of AI, cloud technologies (Huang et al. 2024), smart manufacturing through IoT (Santhosh et al. 2020) and enterprise digital

management (Wei & Yang 2023) can be seen as strategic resources that can be leveraged in meeting ESG regulatory enforcement and stakeholder expectations. The RBV also emphasizes that competitive advantage derived from internal resources depends on a firm's ability to deploy and leverage these resources effectively within a supportive external environment. In this regard, Malaysia's MyDigital policy acts as a critical enabling factor that complements a firms' internal digital resources by providing the necessary infrastructure, regulatory support, and digital ecosystem development (Chong et al. 2025). By offering policy incentives, digital capacity building programs, and clear governance frameworks, MyDigital enhances the value and usability of digital capabilities for achieving ESG goals. Therefore, the presence of MyDigital is expected to strengthen the positive relationship between digital transformation and ESG sustainability performance, demonstrating how firm-specific resources and supportive national policies interact to generate sustainable competitive advantage. The RBV emphasizes how valuable and structured capabilities enable firms to effectively leverage resources, thereby fostering improved sustainability performance (Krajčík et al. 2023; Weber 2024).

The legitimacy theory, on the other hand, emphasizes that firms should consider social acceptance and operate within the social values and norms (Suchman 1995). Firms must align their operations with stakeholder perceptions on sustainability practices (Gulluscio 2023) and demonstrate ethical behavior to bridge legitimacy gaps by being socially responsible compared to their peers (Bamahros et al. 2022). The theory outlines MyDigital's role as a state-led beacon that influences stakeholder expectations, thus explaining the rationale for digital transformation practices in organizations and sustainability norms. This national blueprint sets new standards for local firms to articulate normative goals emphasizing inclusion, governance, and sustainability (MyDigital 2021), which creates pressure on firms to integrate digital transformation initiatives with ESG goals. A recent study by Huang & Shen (2024) indicates that the stakeholders view digital advancement initiatives as a way to enhance firm legitimacy. This is more evident when firms demonstrate social responsibility and manage the risks associated with digital change. As a national policy, MyDigital is expected to bridge the gap between digital transformation and ESG performance to ensure that they are pursued together. Empirically, to improve the legitimacy of digital policies, regulators should empower the public to actively contribute, thereby increasing pragmatic legitimacy to reflect real-business operations (Moss 2025).

DIGITAL TRANSFORMATION AND ESG PERFORMANCE

Firms are adopting transformations in digital technologies to improve financial performance through increased productivity of all resources, ultimately reducing operating costs while supporting firms objectives (Cheng et al. 2023). Beyond financial gains, these transformations improve sustainability outcomes by reducing financial hurdles, strengthening stakeholder involvement, and fostering environmental and social responsibility (Li et al. 2024). Existing literature consistently highlights that digital transformation has emerged as a pivotal strategy adopted by organizations to enhance their ESG performance. The interplay between digital transformation and ESG encompasses a variety of benefits and challenges faced by organizations in the contemporary socio-economic landscape. First, digital transformation greatly strengthens business sustainability practices. A study by Zhang & Jin (2023) demonstrates that digital transformation fosters corporate sustainability by providing frameworks that integrate digital strategies with corporate social responsibility initiatives, enabling greater environmental accountability and carbon emissions reduction through the adoption of innovative technologies. This finding is supported by Liu et al. (2022) who argue that environmental information disclosure, combined with digital transformation, significantly enhances total factor productivity, underscoring the complementary nature of these activities in strengthening a company's commitment to sustainability.

Businesses are intensifying their use of digital technologies to be outstanding among its counterparts (Haohan & Beinan 2023) and enhance firm value, in line with the expanding base of digital literacy among consumers and market dynamics (Holopainen et al. 2023). Çetindamar & Abedin (2020) emphasize that digital transformation, driven by the integration of digital technologies into business processes, represents a significant evolution in culture, business strategy and operating models. This change necessitates a reassessment of corporate direction and management approaches to build dynamic capabilities (Warner & Wäger 2019) in ensuring a constant and effective transition (Azieva et al. 2021). The influence of digital transformation on ESG performance becomes more evident with the increasing use of digital technologies among businesses to foster innovations by developing new and improved sustainable products, or services that can significantly strengthen their ESG performance. Wu & Chang (2022) and Li et al. (2024) further argue that ESG performance can be enhanced through the utilization of digital technologies by enabling effective governance practices and improving operational efficiency. However, the magnitude of these enhancements appears to depend on the level of cultural transitions within the entire organization to sustain the transformation process and ensure the readiness of human capital toward digital innovations (Firican 2023).

Digital transformation improves information flow and processing within the organizations, bridging the gap for information asymmetry between the stakeholders and the firms (Liu et al. 2023), which in turn enhances ESG performance (Zhang & Li 2024). Enhanced digital infrastructure in terms of integrated systems and hardware fosters greater transparency in improving sustainability communications and gaining stakeholder trust (Wei & Yang 2023). In addition, Li et al. (2024) opined that the integration of digital technologies into business processes has a significant positive impact on ESG performance as it can alleviate

financial limitations that could prevent effective ESG practices. To the contrary, Wang & Hou (2024) argue that large investments in digital transformation provide an adverse impact to ESG performance since they involve high levels of uncertainty and hidden costs that can affect shareholder interests and disrupt traditional business processes. The influence of digital transformation toward enhancing ESG performance is aligned with the RBV, which emphasizes the use of unique resources to be more proactive in market dynamics and concurrently accountable for social responsibilities (Zhang & Li 2024). In light of the above arguments, the following hypothesis is developed:

H_1 Digital transformation is positively associated with ESG performance.

DIGITAL POLICY AS MODERATOR

The increasing focus on sustainable development, highlighted by the 2030 Agenda for Sustainable Development, has greatly increased the attention given to ESG principles across various industries, which are seen as crucial for global economic and social sustainability (Sang et al. 2024). Digital transformation, marked by the integration of digital technologies into all facets of a business, is reshaping the operational landscapes and is increasingly recognized for its potential to optimize resource allocation and improve enterprise ESG performance (Huang et al. 2025). This transformation allows companies to manage resources more efficiently, reduce energy consumption and emissions, leading to significant advances in environmental protection (Zhang & Huang 2024). However, successful integration of digital solutions to enhance ESG performance requires a supportive framework of digital policies that can effectively moderate and guide this transformation (Luo et al. 2025).

National initiatives, such as the Malaysia Digital Economy Blueprint (MyDigital), which is part of the Twelfth Malaysia Plan (12MP), serve as a commitment to boost digital adoption across public and private sectors, aiming to position Malaysia as a regional technology hub (Santhanamery et al. 2024). These initiatives are further expanded with the development of JENDELA (Umar 2021) and the National Policy of Industry 4.0 (Ebekozien et al. 2022) to support a resilient digital framework that is essential to drive innovation and overcome disparity in digital inclusion (Holl & Rama 2024). The manufacturing, banking, and healthcare industries rely heavily on technologies such as cloud computing, AI, blockchain, and IoT in their operations. For example, in a manufacturing environment, the technological, environmental, and human factors work synergistically to influence successful digital adoption. Equitable access to digital technologies and unlocking their transformative potential for Malaysian firms hinge on the development of effective regulatory frameworks and increased investment in digital infrastructure (Shahrun et al. 2023).

Existing studies in examining MyDigital policy as moderator in the connection between digital transformation and ESG performance in Malaysia are scarce. However, due to the significance of the policy to boost digital adoption, it can be positioned as a moderator that facilitates the firm's commitment to translate digital transformation into enhanced ESG outcomes. A study by Noor et al. (2022) discusses how the Malaysian government's commitment to digital transformation, encapsulated in MyDigital, reflects efforts to advance the digital maturity of the economy, which is directly linked to improved ESG outcomes. Furthermore, the policy aims to manage social and governance risks associated with digital change. This view is further supported by the objective of MyDigital to provide access to digital technologies from adopting basic digital practices to implementing comprehensive technologies aimed at enhancing digital literacy and skills among the workforce (Leeraphong et al. 2025). By having a robust framework, firms are guided to achieve better sustainability and strategic direction to mitigate governance risks in the selection of infrastructure investment and gain equitable access to digital technologies opportunities (Arshad et al. 2024). Effective risk management facilitates digital transformation to directly enhance ESG performance through transparency, efficiency, and inclusion. However, the moderating effect may also be constrained by implementation challenges, particularly for small firms due to high access costs that constrain digital participation and skills development (Chong et al. 2025), ultimately limiting the firms to align technological upgrades with ESG expectations. Examining the moderating effect of MyDigital policy in the relationship between digital transformation and ESG performance supports that firms benefiting from MyDigital initiatives are more likely to achieve stronger sustainability outcomes through their digitalization efforts. Thus, the next hypothesis is formulated as below:

H_2 MyDigital policy positively moderates the relationship between digital transformation and ESG performance.

RESEARCH METHODOLOGY

DATA COLLECTION AND SAMPLING

This study investigates the impact of digital transformation initiatives on ESG performance, with an emphasis on the extent to which MyDigital policies can moderate this relationship. The dataset consists of 1,399 firm-year observations from 438 Malaysian

listed companies on Bursa Malaysia. The sample selection in this study represents the complete datasets for both dependent and independent variables covering the period from 2015 to 2024. The selection of this timeframe is due to the requirement of Sustainability Framework in 2015 for listed companies to disclose ESG practices (Mohammad & Wasiuzzaman 2021). In addition, Sustainable Development Goals by the United Nation were launched on 1 January 2016 (Georgeson & Maslin 2018), which facilitated voluntary disclosure of non-financial information for investors' effective decisions. The period covered also includes the revision of MCCG in 2021 (Mustafa Khan et al. 2023), which highlighted the need for transparency in sustainability practices by Malaysian companies.

CONCEPTUAL FRAMEWORK

The following conceptual framework (Figure 1) illustrates the relationship between digital transformation (LOG_DTX) and ESG performance (ESGP) with MyDigital policy (MyDIG) as the moderator. In this model, digital transformation (LOG_DTX) is the independent variable, representing the firm's digital transformation practices disclosed in annual reporting. As for the dependent variable, ESG performance (ESGP) captures the environmental, social, and governance outcomes achieved by firms gathered from the London Stock Exchange Group (LSEG) data stream. The relationship between these two variables is moderated by MyDigital (MyDIG), the national digital agenda that shapes the digital ecosystem, infrastructure, and regulatory environment. Its moderating role suggests that the impact of digital transformation on ESG performance depends on national policies to enhance the digital environment in Malaysia and support better sustainability practices. When national digital policies are robust and well-implemented, they can enhance the positive effects of digital transformation on ESG outcomes. Conversely, weaker policy environments may limit firms' ability to translate digital initiatives into better sustainability performance.

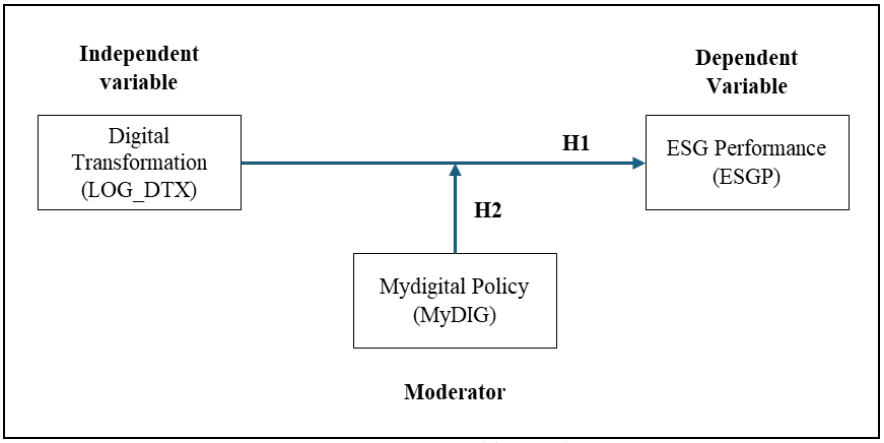

FIGURE 1. Conceptual framework

RESEARCH DESIGN

DEPENDENT VARIABLE

Consistent with prior studies in ESG performance, this study used ESG scores (ESGP) (Makridou et al. 2024; Samsudin et al. 2025) to measure sustainability practices of the firm in protecting the environment, social responsibility, and effective governance in its business. ESG scores are obtained from the London Stock Exchange Group (LSEG) data stream (formerly known as Refinitiv Eikon). The use of LSEG database above other providers mainly due to reliable data source, standardized and widely used across the globe (Samsudin et al. 2025). The data provided are based on publicly available information and media reports making the database a great resource for academic research on ESG performance. The scores extracted from the LSEG are ranging from 0% to 100%, computed using a methodology concerning main ESG scores and its pillars; environmental, social, and governance. Thus, the LSEG ESG score serves as a justified proxy for ESG performance because it is a globally recognized, methodologically standardized, and widely validated measure that has been used consistently in prior empirical research.

INDEPENDENT VARIABLE

The transformation of digital technology in Malaysia is in nascent phases; thus, disclosures related to digital initiatives are widely reflected in the public reports of listed companies. Firms with high levels of digital transformation (LOG_DTX) initiatives will disclose comprehensively on the strategic initiatives and advance technology implementation to gain long-term growth (Guo et

al. 2023). Hence, the study performs textual analysis (Guo et al. 2023; Liu et al. 2023; Gao et al. 2025) on annual, integrated and sustainability reports to obtain the frequencies of digital related keywords as a proxy for digital transformation initiatives of Malaysian listed firms.

The study has identified commonly used digital transformation keywords like AI, IoT, Machine Learning, Fintech, E-Commerce, Cybersecurity, Digital Payment, Digital Talent, Digital Infrastructure, Data Analytics, Digital Inclusion and Digital Divide to describe the technology advancement initiatives in the respective firms (Singh et al. 2025; Jannepally et al. 2024; Mohd Dali et al. 2025). Word searches and their frequencies in the public report were counted using Nvivo software (Kraiwanit et al. 2023) and log-transformed using natural logarithm (Liu et al. 2023). Firms with the highest total word frequencies are assumed to have extensive digital transformation initiatives among their peers. The frequency of digital-related keywords in firms' public reports serves as a proxy for digital transformation initiatives, as it reflects the extent to which companies disclose and emphasize their strategic adoption of advanced technologies in line with established textual-analysis approaches in prior studies. Moreover, the natural log was applied to reduce the skewness and minimize the influence of values.

MODERATING VARIABLE

This study employs the MyDigital policy (MyDIG) as a moderating variable. This policy was established by the Malaysian government to serve as a commitment for digital transformation implementation in advancing their digital economy of the country (Noor et al. 2022). The MyDIG, coded as 0 for years pre-establishment of the policy; year 2021 and 1 for years post-2021. Dummy coding is appropriate because MyDIG represents a discrete policy intervention rather than a continuous measure. The year 2021 was chosen as the cut-off because MyDIG was officially launched that year, marking the beginning of Malaysia's coordinated national digital transformation strategy (Noor et al. 2022). Moreover, binary coding (1, 0) is widely used by previous studies that use government policy as moderator such as Yin et al. (2024). The selection of MyDigital as moderator is to investigate the role of MyDIG, whether the policy acts as a supportive ecosystem, a framework and infrastructure for Malaysian companies to leverage technologies effectively to enhance ESG performance.

CONTROL VARIABLES

This empirical study has selected four control variables to ensure the robustness of the analysis and to ascertain the causal relationship between digital transformation and ESG performance is not influenced by other factors. The variables used in this study, such as board size, firms' size, firm performance and financial leverage may affect the dependent variable and are therefore controlled for. Following prior literature, board size (BDSIZE) is measured by the number of people who sit on the corporate board of the firm (Zhang & Huang 2024). Following previous study (i.e Treepongkaruna et al. 2024), we use a simple count of BDSIZE as it influences firm decisions on ESG. Firm size (FISZ) refers to the scale of business operations and is measured by the natural logarithm of total assets (Zhang & Huang 2024; Samsudin et al. 2025). The log transformation of total assets is because this type of data is typically highly skewed, thus the log transformation normalizes the distribution (Jimichi et al. 2023). Larger firm size normally has greater resources to invest in sustainability programs. The third variable is firm performance is Return on Assets (ROA), which is measured using return on assets as widely used in corporate governance study (Makridou et al. 2023; Zhang & Huang 2024; Samsudin et al. 2025). ROA measures a firm's effectiveness in leveraging its resources to generate economic benefit that could maximize stakeholder's value and its ability to capture operational efficiency (Bani Yousef et al. 2024). Finally, financial leverage (LEVE) is indicated by the debt-to-equity ratio or can be computed by dividing total debt to total equity (Makridou et al. 2023; Samsudin et al. 2025). This ratio captures the extent to which firms rely on debt financing, which may affect their decision to invest in ESG initiatives (Alahdal et al. 2025). Firms with high leverage levels will focus on debt clearing rather than allocating their funds in ESG investments. In addition, high leverage levels may reflect weaker governance practices in managing its risks (Shahrun et al. 2023). A summary of all variables and their measurements is described in Table 1.

TABLE 1. Variables and definitions

Variable	Symbol	Definition
Independent		Natural logarithm of digital keywords frequency in public reports
Digital Transformation	LOG_DTX	
Dependent		The scores extracted from LSEG, range from 0 to 100 as a percentage
ESG Performance	ESGP	
Moderator		A binary variable, where period before introduction of MyDigital (before year 2021) denoted as 0,
MyDigital	MyDIG	while period after introduction of MyDigital (after year 2021) denoted as 1
Controls		
Board Size	BDSIZE	No of board directors of the firm
Firm Size	FISZ	Natural logarithm of the total assets
Leverage	LEVE	Ratio of the total debt to total asset
Firm Performance	ROA	Ratio of net income divided by total assets

MODEL SPECIFICATION AND DATA ANALYSIS

The following model specification has been developed to estimate the relationship between digital transformation and ESG performance and how MyDigital policy moderates this association:

$$ESGP_{it} = \beta_0 + \beta_1 LOG\_DTX_{it} + \beta_2 BDSIZE_{it} + \beta_3 FISZ_{it} + \beta_4 LEVE_{it} + \beta_5 ROA + \varepsilon_{it} \quad (1)$$

$$ESGP_{it} = \beta_0 + \beta_1 LOG\_DTX_{it} + \beta_2 MyDIG_{it} + \beta_3 LOG\_DTX*MyDIG_{it} + \beta_4 BDSIZE_{it} + \beta_5 FISZ_{it} + \beta_6 LEVE_{it} + \beta_7 ROA + \varepsilon_{it} \quad (2)$$

where β_0 is the intercept and β_i are the coefficients for the independent variables. ESGP represents a dependent variable of the study as measured by ESG scores. The independent variable is digital transformation (LOG_DTX), which reflects the extent of digital initiatives implemented by the Malaysian firms. The moderator, MyDigital (MyDIG) represents the national policy while the interaction term of digital transformation and MyDigital policy (LOG_DTX*MyDIG) represents the moderating effect. The control variables reflected in both equations are board size (BDSIZE), firm size (FISZ), financial leverage (LEVE), and financial performance (ROA). In these equations, *i* reflects on firms and *it* reflects time. Finally, ε_{it} is an error term.

The study employed quantile regression in analyzing the relationship between digital transformation and ESG performance, while MyDigital policy acts as a moderator. Before employing quantile regression, two common testing approaches will be conducted, namely Breusch-Pagan Lagrangian Multiplier (LM) test and Hausman test to determine the most appropriate model for the study. Quantile regression has been introduced by Koenker & Bassett in 1978 and has become increasingly important among the researchers to investigate how digital transformation influences different quantiles of ESG performance (Koenker & Hallock 2001). In addition, the incorporation of MyDigital as moderator allows the examination of national policy influence across the ESG performance distribution. Consistent with prior studies (Tanin et al. 2024; Samsudin et al. 2025), this study used 10th, 25th, 50th, 75th, and 90th quantiles to investigate the impact of digital transformation and the moderating role of MyDIG on ESGP on different quantile of ESG performance. Among the rationales for using quantile regression can be explained by the different degrees of ESG practices adopted by Malaysian listed firms, with several companies being at a mature stage while others are still at an early stage of practice. Furthermore, this method takes into account unknown differences between entities in the dataset and controls for heterogeneous covariates effects (Sahu et al. 2025; Samsudin et al. 2025).

EMPIRICAL RESULTS AND DISCUSSIONS

DESCRIPTIVE ANALYSIS

The following Table 2 shows the descriptive analysis for all variables. The ESG score (ESGP) has a mean value of 43.703 percent, with a minimum value of 8 percent and a maximum of 85.86 percent. Regarding the frequency of digital keyword reports by Malaysian companies, on average, there are 75.52 words related to digital, where at least only 3 words occur while the maximum is 464 words. Regarding the control variables, average companies have 8 members of board of directors (BDSIZE), with minimum 5 members and maximum 14 members. The average total assets (FISZ) for companies are RM 25.45 billion, a minimum of RM0.056 billion and a maximum of RM602.4 billion. For financial leverage (LEVE), average companies have LEVE of 0.566 percent, a minimum of 0 percent and a maximum of 4.871 percent. Lastly, Malaysian companies' performance (ROA) has an average of 0.034, a minimum of -0.272 and a maximum of 0.252.

TABLE 2. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	p10	p25	Median	p75	p90	Min	Max	vif	S-wilk test (p-value)
ESGP	1399	43.703	18.511	20.32	28.91	41.93	57.53	69.83	8	85.86		0.000
DTR	1399	75.524	85.472	11	21	43	96	191	3	464		0.000
LOG DTX	1399	3.776	1.088	2.398	3.045	3.761	4.564	5.252	1.099	6.14	1.26	0.000
MyDIG	1399	0.736	0.441	0	1	1	1	1	0	1	1.28	0.000
BDSIZE	1399	8.104	1.992	6	7	8	9	11	5	14	1..27	0.000
FISZ (RM BIL)	1399	25.45	829.6	0.250	0.660	2.31	11.52	45.05	0.056	602.4		0.000
LOG FISZ	1399	21.774	2.002	19.345	20.315	21.56	23.167	24.531	17.834	27.124	1.87	0.000
LEVE	1399	.566	.773	.009	.089	.329	.71	1.309	0	4.871	1.10	0.000
ROA	1399	.034	.074	-.035	.007	.031	.067	.111	-.272	.252	1.02	0.000

The following Table 3 represents the pairwise correlation coefficients calculated between the variables studied. The data reveals a positive correlation between ESGP and LOG_DTX, indicating that as ESGP increases, LOG_DTX also tends to rise. Conversely, ESGP exhibits a negative correlation with MyDIG, suggesting that ESGP scores are relatively low in years when digital policy initiatives are implemented. This inverse relationship may reflect transitional phases in governance or shifts in priorities associated with the rollout of national digital strategies, providing valuable insight into the dynamics between these variables.

Since all correlation values are below 0.7, except for the year and MyDIG variables with a correlation of 0.84, multicollinearity is not a significant concern. This is further supported by the VIF values being less than 0.5. Regarding the year and MyDIG variables, the high correlation stems from both being year-specific dummy variables. In panel data regression, the year assigned to MyDIG will be omitted to address this.

TABLE 3. Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) ESGP	1.000								
(2) LOG_DTX	0.540***	1.000							
(3) MyDIG	-0.158***	-0.093***	1.000						
(4) BDSIZE	0.343***	0.251***	-0.227***	1.000					
(5) FISZ	0.547***	0.436***	-0.449***	0.455***	1.000				
(6) LEVE	0.139***	0.100***	-0.126***	0.120***	0.284***	1.000			
(7) ROA	0.185***	-0.024	-0.010	0.065**	0.008	-0.091***	1.000		
(8) SECTOR	0.087***	0.229***	0.012	0.124***	0.084***	0.058**	-0.095***	1.000	
(9) YEAR	-0.128***	-0.013	0.844***	-0.249***	-0.468***	-0.141***	-0.022	0.006	1.000

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

To test our initial hypothesis, panel regression models were utilized to examine the relationships between ESGP and LOG_DTX, as presented in Table 4. First, we estimated the Ordinary Least Squares (OLS) model demonstrated in Column (1). The findings reveal that LOG_DTX is positively and significantly associated with ESGP at the 1% significance level. The coefficient of 6.360 suggests that a one-unit increase in LOG_DTX leads to approximately a 6.360 percentage point rise in ESGP, while other variables remain constant. Additionally, the MyDIG dummy variable, coded as 1 for years post-2021 and 0 otherwise, shows a positive association with ESGP at the 1% level. The coefficient of 6.274 indicates a structural shift, whereby firms' ESGP scores increased by roughly 6.274 percentage points following the implementation of the MyDIG initiative.

In Column (2), the Random Effects model reveals consistent findings. The association between LOG_DTX and ESGP remains positive and significant at the 1% level, although the coefficient reduces to 2.659, indicating a more moderate effect. Conversely, the MyDIG coefficient rises substantially to 18.110, also significant at the 1% level, suggesting a stronger policy impact within this specification.

In Column (3), the Fixed Effects model likewise displays a positive and significant relationship between LOG_DTX and ESGP at the 1% level, albeit with a smaller coefficient of 1.005. Notably, the effect of MyDIG is even more pronounced in this model, showing a coefficient of 22.710, again significant at the 1% level, and directly indicating a substantial post-policy improvement in ESGP scores.

The variation in coefficient estimates across the Random and Fixed Effects models may be attributed to differences in accounting for unobserved heterogeneity. The Random Effects model presumes that individual-specific effects are uncorrelated with the independent variable, potentially capturing more between-entity variation. In contrast, the Fixed Effects model controls all time-invariant characteristics of each firm, thereby isolating the within-firm variation over time (Bell et al. 2019). Consequently, the Fixed Effects model might generate smaller coefficient estimates if some explanatory power of LOG_DTX is due to unobserved, time-invariant firm attributes. Similarly, the larger MyDIG coefficient in the Fixed Effects model implies that controlling for firm-specific factors unveils stronger temporal policy impacts than those observed in the Random Effects model.

According to the Hausman test results reported in Table 5, with a p-value below 0.05, the Fixed Effects model is preferred over the Random Effects model, indicating a correlation between firm-specific effects and regressors.

TABLE 4. Regression model

DEP VAR: ESGP VARIABLES	(1) OLS	(2) RANDOM (RE)	(3) FIXED (FE)
LOG_DTX	6.360***	2.659***	1.005**
	(0.414)	(0.379)	(0.432)
MyDIG	6.276***	18.11***	22.71***
	(2.210)	(1.233)	(1.297)
BDSIZE	0.773***	0.198	-0.173
	(0.210)	(0.196)	(0.217)
FISZ	3.404***	5.111***	1.571
	(0.288)	(0.392)	(1.114)
LEVE	0.824*	0.0872	0.0534
	(0.499)	(0.461)	(0.509)

ROA	51.39***	32.85***	17.00*
	(5.095)	(6.143)	(9.278)
SECTOR	Included	Included	Omitted
YEAR	Included	Included	Omitted
Constant	-76.62***	-100.6***	-11.09
	(11.13)	(11.98)	(24.02)
Observations	1,399	1,399	1,399
Number of COMPID	438	438	438
R-squared	0.487		0.493
R-squared within		0.475	0.493
R-squared between		0.408	0.0586
R-squared overall		0.428	0.0760
F	56.75***	1144***	70.86***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 5. Model specification

Test	Chi2 (p-value)	Suitable model
Breusch and Pagan Lagrangian multiplier test for random effects	1325.38 (0.00)	Random effect model
Hausman test	110.91 (0.00)	Fixed effect model

MODERATOR AND ROBUST STANDARD ERRORS REGRESSION

To test the second hypothesis that the MyDIG policy affects the association between LOG_DTX and ESGP, the Fixed Effects model is employed with MyDIG included as a moderating variable in Table 6. In Column (1), the baseline Fixed Effects regression shows that the relationship between LOG_DTX and ESGP is positive and statistically significant at the 10% level. The estimated coefficient of 1.144 suggests that a one-unit increase in LOG_DTX correlates with an approximate 1.144 percentage increase in ESGP, holding other factors constant. The MyDIG dummy variable is positively associated with ESGP at the 1% significance level, with a coefficient of 23.35, indicating a substantial structural change following the policy's implementation.

To address potential heteroscedasticity, the model in Column (2) is re-estimated using White-Huber robust standard errors. The results show that LOG_DTX is no longer significantly associated with ESGP, while MyDIG maintains its positive and significant association at the 1% level, reinforcing the robustness of the policy effect.

The interaction term (MyDIG × LOG_DTX) does not demonstrate a statistically significant effect on ESGP. This implies that the MyDIG initiative does not significantly moderate the relationship between digital transformation disclosure (LOG_DTX) and ESG performance. In summary, while MyDIG is associated with higher overall ESGP scores, it does not appear to influence the link between LOG_DTX and ESGP specifically for Malaysian companies.

TABLE 6. Fixed effect model and White-Huber robustness test

DEP VAR: ESGP	(1)	(2)
VARIABLES	Fixed effect	Robust standard error
LOG_DTX	1.144*	1.144
	(0.662)	(0.943)
MyDIG	23.35***	23.35***
	(2.662)	(5.055)
MyDIG × LOG_DTX	-0.177	-0.177
	(0.643)	(1.158)
BDSIZE	-0.169	-0.169
	(0.218)	(0.289)
FISZ	1.577	1.577
	(1.115)	(2.317)
LEVE	0.0439	0.0439
	(0.511)	(0.948)
ROA	17.30*	17.30
	(9.348)	(14.04)
SECTOR	Omitted	Omitted
YEAR	Omitted	Omitted
Constant	-11.73	-11.73
	(24.15)	(51.13)
Observations	1,399	1,399
Number of COMPID	438	438
R-squared	0.493	0.493
F	65.74***	25.21***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

PRE AND POST MYDIGITAL

The primary findings indicate that MyDIG significantly influences company scores, yet no evidence supports the moderating effect. Consequently, the sample was divided into pre- and post-MyDIG periods as noted in Table 7 for further analysis. Employing fixed effects and robust standard error methods, the results reveal that during the pre-MyDIG period (prior to 2021), LOG_DTX exhibits no association with ESGP. This suggests that digital-related company information did not impact ESG scores during this time frame.

In the post-MyDIG period (2021 and beyond), a positive and significant relationship between LOG_DTX and ESGP emerges. This finding underscores the growing importance of digital information as a criterion in ESG assessments during this period. It is also worth noting that Malaysia's strategic transformation toward digitalization during this era provided industries with greater incentives to adopt digital practices within their operations.

Digitalization serves as a catalyst for green initiatives by facilitating smarter resource utilization, minimizing emissions, and enhancing environmental transparency across various sectors. Such advancements contribute to elevating company's ESG scores and aligning with broader sustainability objectives (Koranye et al. 2025).

TABLE 7. Fixed effects and robustness test (pre and post MyDigital)

	Pre-MyDigital period		Post-MyDigital period	
DEP VAR: ESGP	(1)	(2)	(3)	(4)
VARIABLES	Fixed effect	Robust standard error	Fixed effect	Robust standard error
LOG_DTX	-0.328	-0.328	0.834**	0.834*
	(1.251)	(1.483)	(0.414)	(0.463)
BDSIZE	-0.745	-0.745	0.0990	0.0990
	(0.490)	(0.561)	(0.223)	(0.249)
FISZ	4.714	4.714	0.829	0.829
	(3.454)	(5.077)	(1.183)	(1.579)
LEVE	-0.709	-0.709	0.671	0.671
	(1.323)	(1.485)	(0.557)	(0.586)
ROA	25.49	25.49	-6.557	-6.557
	(22.68)	(19.19)	(10.27)	(13.61)
SECTOR	Omitted	Omitted	Omitted	Omitted
YEAR	Omitted	Omitted	Omitted	Omitted
Constant	-61.41	-61.41	15.27	15.27
	(82.02)	(123.1)	(25.07)	(33.83)
Observations	250	250	1,149	1,149
R-squared	0.375	0.375	0.279	0.279
F	12.26***	6.795***	33.99***	22.03***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

QUANTILE REGRESSION

Our results from previous findings might be biased due to the non-normality distribution, as the normality test of each variable indicated that our data does not meet the assumptions of normality ($p < .05$) as reported under the Shapiro-Wilk test in Table 2. This method is also useful for the non-linear data distribution as it captures the company's ESG score along the quantile distribution (Bani Yousef et al. 2023). Consequently, our additional analysis using quantile regression may provide more insight into the effect of LOG_DTX and the moderating role of MyDIG on ESGP at quantiles distribution in Table 8.

The quantile regression results indicate that LOG_DTX has a significant positive impact on ESGP across most quantiles, with coefficients of 3.603 at the 10th quantile ($p < 0.05$), 3.427 at the 25th quantile ($p < 0.10$), 5.484 at the 50th quantile ($p < 0.01$), and 4.481 at the 75th quantile ($p < 0.01$). The finding shows that the strength and significance of this effect varies throughout the distribution as shown in Figure 1. Even at the 90th quantile, LOG_DTX has no significant effect on ESGP with coefficient 2.991 and p value larger than 10 percent significant level ($p > 0.1$).

The positive association suggests that increases in digital transformation initiatives tend to enhance ESGP performance in organizations with low to moderately high ESGP scores. This non-linearity challenges simplistic universal approaches to digital transformation and implies that firms should calibrate their digital strategies according to their current ESG performance levels to maximize the benefits (Li et al. 2025). However, no significant association was observed at the 90th quantile, indicating a diminishing marginal effect of digital transformation emphasis among entities already operating at the highest ESGP levels. This pattern may reflect a saturation effect, where additional digital engagement yields limited benefits once a threshold of ESGP maturity is reached. The result also shows that firms at different quartiles do not experience digital transformation in the same way because they differ in terms of ESG maturity, organizational operations, organizational structure, or had different capabilities to integrate technology into sustainability practices.

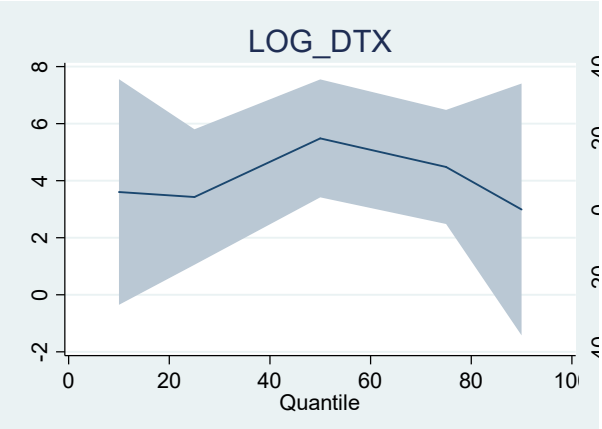

FIGURE 1. Quantile plot of digital transformation

Regarding the MyDIG variable, only samples in the lowest quartile (q10) have positive association with ESGP at 10 percent significant level. While the MyDIG initiative in sample at 25th, 50th, 75th and 90th quantiles had no effects on ESGP. The results show that this may be explained by the relatively nascent stage of digital adoption among firms with the lowest ESGP scores at the time MyDIG was introduced. As illustrated in Figure 2, for entities at the lower end of the ESGP distribution, MyDIG initiatives likely provided critical digital infrastructure and resources that these organizations previously lacked, enabling a measurable uplift in ESG performance. In contrast, firms in higher ESGP quartiles may have already implemented advanced digital strategies or possessed greater readiness to capitalize on digital tools, thus experiencing diminishing incremental gains from MyDIG's rollout.

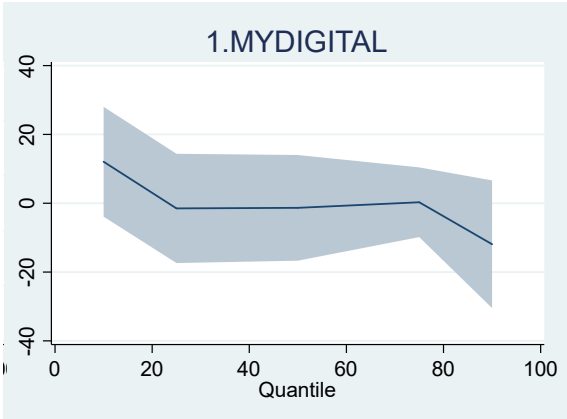

FIGURE 2. Quantile plot of MyDigital

As for the interaction term, MyDIG × LOG_DTX, the positive association with ESGP is only in the samples in the higher quartiles (q75 with coefficient of 2.442 and q90 with coefficient of 3.756) at 1 percent and 5 percent significant level respectively. This pattern suggests that the benefits or effects of the interaction between digitalization (as captured by MyDIG) and the logarithm of DTX are not uniformly distributed across all levels of ESGP outcomes but rather become more pronounced among entities that already score relatively high on ESGP as illustrated in Figure 3. One possible explanation is that organizations or firms at the upper end of ESGP performance may already possess the foundational structures, resources, or strategic orientation necessary to fully leverage digital initiatives. In such contexts, digital transformation efforts could synergize more effectively with existing ESGP frameworks, amplifying positive outcomes. By contrast, entities in the lower quartiles might face constraints such as limited digital maturity, resource scarcity, or lack of alignment between digital and ESGS priorities, which could weaken the impact of the interaction. For these firms, the integration of digital technologies often requires substantial capital investment and operational restructuring, making them more cautious in adopting or leveraging national digital initiatives such as MyDIG. These financial and capability constraints limit their ability to generate synergistic effects between MyDIG and their internal digital transformation efforts, which explains the absence of significant interaction effects in the lower quantiles.

Regarding the control variables, BDSIZE has a positive and significant effect on ESGP in the 10th to 75th quantiles, while not significant in the 90th quantile. This shows that larger board size increases ESGP in low to mid ESG firms, due to the better oversight and resource access. However, for the top quartile, it also implies that the board might minimize the overseeing mechanism, as this firm already had better ESG performance. For LOG_FISZ, it is positive and significant across all quantiles. This indicates that larger firms had more resources to perform better in ESG. For LEVE, it had negative association with ESGP in the 10th quantile, while it became positive in the 75th and 90th quantile. This explains that firms in the low quantiles had limited resources, therefore performing ESG activities reflects reduction face struggle with ESG investment. Regarding ROA, it is shown to be positive and significant on ESGP across all quartiles, which indicates profitable firms had achieved higher ESGP.

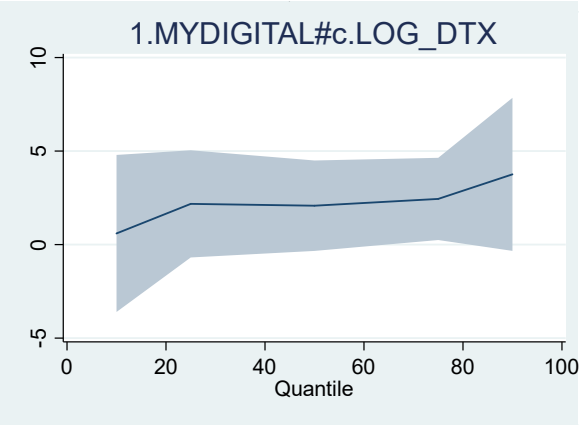

FIGURE 3. Quantile plot of interaction between MyDigital and digital transformation

TABLE 8. Quantile regression model

DEP VAR: ESGP	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
LOG_DTX	3.603**	3.427*	5.484***	4.481***	2.991
	(1.411)	(1.836)	(1.467)	(1.132)	(2.130)
MyDIG	12.07*	-1.496	-1.334	0.294	-11.91
	(6.796)	(6.812)	(6.853)	(5.516)	(7.628)
MyDIG × LOG_DTX	0.596	2.177	2.079	2.442***	3.756**
	(1.520)	(1.779)	(1.439)	(0.945)	(1.831)
BDSIZE	0.806***	1.085***	1.048***	0.803***	0.546
	(0.305)	(0.310)	(0.265)	(0.264)	(0.390)
LOG_FISZ	4.195***	3.985***	3.601***	3.004***	2.402***
	(0.357)	(0.512)	(0.454)	(0.400)	(0.537)
LEVE	-1.070***	-0.0485	0.477	1.327*	1.958***
	(0.284)	(0.645)	(0.941)	(0.689)	(0.700)
ROA	36.27***	45.57***	42.14***	50.86***	61.92***
	(8.321)	(10.42)	(8.369)	(7.403)	(13.69)
SECTOR	Included	Included	Included	Included	Included
YEAR	Included	Included	Included	Included	Included
Constant	-90.23***	-84.31***	-86.65***	-59.53***	-33.71**
	(10.75)	(13.70)	(12.49)	(12.53)	(16.11)
Observations	1,399	1,399	1,399	1,399	1,399
Psuedo R-Squared	0.256	0.276	0.321	0.338	0.313

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

DISCUSSION

The positive association between LOG_DTX and ESGP across all models suggests that digital transformation (LOG_DTX) has a substantial impact on firms' ESG scores. From an RBV perspective, firms that invest in digital transformation can strengthen their ESG positions and long-term competitive advantages through their distinctive technologies and inimitable capabilities (Huang et al. 2024). This indicates that firms that invest more in digital transformation can improve their ESG performance. This could be due to enhanced data management, better resource utilization, and improved transparency facilitated by digital technologies (Wei & Yang 2023). This relationship can be theoretically grounded in legitimacy theory. For example, digital technologies enhance a firm's capacity to utilize data aligned with ESG activities, thereby enhancing transparency and

accountability (Gulluscio 2023). Such technological capabilities become firms' strategic assets, thus enabling them to integrate sustainability metrics into operational and strategic decision-making processes.

The MyDigital dummy variable shows a significant positive association with ESGP, indicating that the MyDIG initiative has led to an improvement in ESG scores during its post-2021 implementation. The pronounced effect of the MyDIG initiative suggests that organizational pressures and policy frameworks play a catalytic role in shaping corporate ESG behavior (Shahrun et al. 2023). By embedding digitalization within the national development agendas, MyDIG has likely altered normative expectations and regulatory environments, prompting firms to align with emergent standards of sustainability and digital governance. This implies that organizations respond to external pressures, such as government mandates or policy, industry and stakeholder demand by adopting technology in their operations. In this context, the post-2021 structural shift reflects not merely technological adoption but a broader reconfiguration of corporate priorities, where ESG performance becomes both a compliance imperative and a reputational asset in the digital economy.

The absence of a significant moderating effect from the MyDIG × LOG_DTX interaction suggests that while MyDIG has clearly boosted overall ESGP scores, it doesn't change how digital transformation initiatives (LOG_DTX) relate to ESG performance. This likely reflects MyDIG's broad focus on digital infrastructure and policy, rather than direct influence on transparency. MyDIG operates primarily at the national policy and infrastructure level, aiming to build long-term digital capacity through ecosystem development, talent cultivation, and foundational digital infrastructure. These broad, macro-level reforms can elevate overall ESG performance by improving transparency expectations and digital readiness across the economy, but they do not necessarily alter how individual firms translate their own digital transformation efforts into ESG outcomes. Moreover, MyDIG is still a relatively recent initiative, and national digital strategies typically require several years before their influence diffuses into firm-level governance structures, reporting systems, and sustainability practices. As a result, its early effects are more likely to appear as general improvements in ESG performance rather than as changes in the strength of the relationship between digital transformation and ESG outcomes.

Firms may have improved ESG practices, such as reporting and stakeholder engagement, due to MyDIG, but not necessarily in ways that strengthen the link between digitalization and ESG outcomes. LOG_DTX appears to function more as a technical tool at the firm level, while MyDIG acts as a top-down signal that encourages general ESG improvements (Salin et al. 2023). The ESGP gains from MyDIG may be driven more by reputational concerns or industry benchmarking than by changes in how firms use digital technologies. The drop in the significance of LOG_DTX when using robust standard errors also suggests that its impact is sensitive to data variation, reinforcing the idea that digitalization alone is not a strong driver of ESG performance in Malaysia.

Regarding the pre- and post-MyDIG period, the emergence of a significant relationship between digital transformation (LOG_DTX) and ESG performance in the post-MyDIG period highlights a shift in evaluative norms, where digital transparency has become more integral to sustainability assessments. Prior to 2021, LOG_DTX held no predictive power over ESG scores, suggesting that digital transformation disclosures were not yet prioritized or systematically linked to ESG criteria in that period. However, following Malaysia's strategic push toward digitalization under MyDIG, firms were incentivized to adopt digital practices that enhance environmental accountability, operational efficiency, and stakeholder engagement. This transformation aligns with broader global trends where digitalization acts as a catalyst for green innovation, enabling more innovative resource use, reducing emissions, and improving data-driven ESG reporting, thereby reinforcing the role of digital infrastructure as a technical enabler and a normative signal of responsible corporate behavior.

Regarding our results on quantile regressions, we reveal a nuanced, distribution-sensitive relationship between digital transformation (LOG_DTX), ESG performance, and the moderating role of MyDIG. Unlike traditional models that rely on mean values (Koenker & Hallock, 2001), this approach captures how digitalization influences ESGP differently across performance tiers. LOG_DTX shows a significant positive effect from the 10th to 75th quantiles, suggesting that digital engagement is particularly beneficial for firms with low to moderately high ESG scores. However, the absence of significance at the 90th quantile points to a saturation effect, where highly rated firms may already have maximized digital tools, leaving little room for further ESG gains. MyDIG's impact is similarly stratified: its positive association with ESGP is confined to the lowest quantile, indicating that policy-driven digital infrastructure primarily benefits lagging firms by lifting foundational capabilities. Interestingly, the interaction term (MyDIG × LOG_DTX) only becomes significant in the upper quantiles, implying that digital transformation initiatives synergize most effectively with firms that already possess mature ESG frameworks. This difference highlights that digital strategies should be matched to a company's level of ESG development, because a universal approach might miss the extent to which each company is prepared to benefit from digital changes.

This pattern implies that digital strategies should be calibrated to a firm's level of ESG readiness, as a uniform, one-size-fits-all digitalization approach may overlook substantial differences in firms' capacity to convert digital tools into meaningful ESG improvements. For policymakers, the findings highlight that national digital initiatives like MyDIG may disproportionately benefit firms with advanced ESG capabilities unless complementary policies are introduced to support lower-performing firms in building foundational ESG systems. For firms, the results underscore the importance of strengthening ESG governance before expecting digital transformation to yield sustainability benefits. Over time, as MyDIG matures and firms

improve their ESG infrastructure, the moderating effect may become more widespread, but at present it appears concentrated among the most ESG-developed firms

IMPLICATIONS

From a practical standpoint, the findings provide important implications for policymakers, business practitioners, and key stakeholders, particularly investors. For policymakers, the results suggest that digital transformation remains a critical lever for strengthening ESG performance, even though the moderating role of MyDigital is not yet evident within the current observation period. This highlights the need for policymakers to move beyond broad national digital agendas toward more targeted and industry specific interventions that reflect different levels of digital maturity, ESG readiness, and operational constraints across sectors. Regulators and relevant agencies could refine existing digital transformation initiatives by introducing sector tailored incentives, ESG linked digital grants, and capability building programs, especially for industries that lag behind in digital readiness and sustainability practices. In addition, regulators may consider establishing standardized ESG digital reporting guidelines and encouraging firms to adopt technology enabled monitoring systems such as automated data tracking, digital audit trails, and real time sustainability reporting. These measures can improve transparency, reduce greenwashing risks, and strengthen accountability while accelerating ESG integration into business operations.

For business practitioners, the findings reinforce the strategic importance of aligning digital transformation with the firm's sustainability roadmap rather than treating it solely as a technology upgrade. Firms should view digital transformation as a strategic catalyst for improving operational efficiency, strengthening governance mechanisms, enhancing stakeholder engagement, and achieving long term sustainable growth in the digital economy. Practitioners may also benefit from embedding ESG priorities into digital investment decisions by adopting digital tools that support energy efficiency, responsible supply chain management, employee wellbeing, and compliance monitoring. For investors, the findings indicate that digital transformation initiatives can serve as a meaningful signal of a firm's capacity to strengthen ESG performance. Investors can therefore integrate firm level digital readiness and technology adoption indicators into ESG screening and engagement strategies, while also evaluating whether firms translate national policy alignment into measurable sustainability outcomes.

CONCLUSION

This study investigates the impact of digital transformation on ESG performance within the scope of Malaysian listed firms, with the national policy, MyDigital, as a moderating factor. Since the policy was established in 2021, this study has investigated and compared the effects within the pre- and post-implementation periods. Digital policies are crucial in shaping a regulatory environment that facilitates the utilization of digital technologies to support sustainable practices, while addressing the potential risks arising from digital transformation (Salin et al. 2023).

After several tests were performed, the findings of the study demonstrate that digital transformation has a positive relationship with ESG performance. The development of the policy proved governments' commitment to digital transformation (Noor et al. 2022), and in parallel, the policy frameworks play a significant role in directing corporate ESG practices (Shahrun et al. 2023). Thus, post MyDigital implementation caters to both technological adoption and other corporate priorities, and the ESG practices serve as a reputational asset in the digital economy. Prior to 2021, before the establishment of digital policy, the digital transformation was not yet prioritized or linked to ESG criteria. Further analysis shows that when MyDigital acts as a moderator in the causal relationship, it is notable for the absence of a moderating effect, suggesting that the policy does not change the relationship between digital transformation and ESG performance. In this context, the ESG practices may show improvement through policy guidelines but do not strengthen the relationship between digitalization and ESG outcomes. Under quantile regressions, the results demonstrate that the digital transformation effect on ESG performance is more apparent for firms with low to moderate ESG scores. This suggests that digital technologies offer the most benefits to firms that are still in the sustainability development stage. In contrast, the effect stabilizes for higher scorers, indicating that these firms have already implemented advanced technologies in enhancing ESG outcomes.

Consistent with RBV, firms invest in digital transformation to benefit from real-time monitoring and automation (Salin et al. 2023), ultimately differentiating themselves among other peers in the competitive market via distinctive technologies and inimitable capabilities (Huang et al. 2024). The national policy, namely MyDigital, enhances digital transformation and ESG performance independently, indicating that the establishment of the policy functions as complementary resources to amplify internal digital capabilities as an improvement in ESG scores, further strengthening the application of RBV. According to legitimacy theory, the significance of MyDigital in shaping ESG outcomes accentuates its legitimacy function, supporting firms to strengthen their social license to operate in meeting regulators and societal expectations. Thus, MyDigital not only supports firms for digital and sustainability initiatives through valuable resources but also strengthens the intersection between RBV and legitimacy theories even though MyDigital does not directly influence the relationship between them.

Several limitations of this study provide pathways for future research. First, the study period from 2015 to 2024 includes only a relatively short post MyDigital window, which may not fully capture the policy's longer-term influence on corporate digital transformation and sustainability outcomes. Future research should extend the timeframe to examine whether MyDigital generates delayed or cumulative effects as implementation matures, organizational adoption deepens, and complementary ecosystems such as digital infrastructure, talent pipelines, and regulatory clarity become more established. Second, this study focuses on overall ESG performance and does not differentiate between the environmental, social, and governance pillars. Hence, future studies should disaggregate ESG into its individual dimensions to determine whether digital transformation has stronger effects on certain pillars, for example whether digital tools primarily enhance governance and reporting systems, or whether they also generate measurable environmental improvements through resource optimization and emissions monitoring. Third, this study relies on a quantitative approach and may not fully capture the organizational realities that shape the digital transformation and ESG relationship. Future research could incorporate qualitative methods such as interviews, focus group discussions, or case studies to provide deeper practitioner-based insights into implementation barriers, industry specific constraints, leadership commitment, data availability challenges, and strategic trade-offs that influence how digital transformation translates to ESG performance in practice.

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