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THE ROLE OF COUNTRY'S GREEN BRAND AND DIGITALIZATION IN ENHANCING ENVIRONMENTAL, SOCIAL, AND GOVERNANCE PERFORMANCE

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ABSTRACT: In the contemporary global landscape, characterised by increasing concerns about climate change, sustainable development, and corporate responsibility, it is necessary to study and address pressing issues at the intersection of environmental consciousness, technological advancement, and governance practices. This paper aims to examine the relationship between the environmental, social, and governance (ESG) pillars of a country's development, green brand and digitalisation. To achieve the study's goal, partial least squares structural equation modelling (PLS-SEM) was applied. The object of investigation was EU countries for 2016-2020. The findings allow us to conclude that a country's green brand is conducive to ESG performance by attracting green investment in renewable energies, social projects, and innovations. The results confirm that governments should prioritise sustainability initiatives, such as investing in renewable energy, adopting sustainable practices, and implementing environmental and social policies. Such efforts can enhance a country's green brand and lead to positive ESG outcomes, attracting more responsible businesses and investors. Moreover, digitalisation promoted governance by 0.142. The results showed that digitalisation could be a powerful tool for improving a country's green brand and ESG performance. Digital technologies can help countries monitor and manage environmental resources, promote sustainable practices, and engage with stakeholders.

KEYWORDS: corporate social responsibility disclosure, sustainable development, environmental pollution, good governance, development governance

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Introduction

The attainment of sustainable development goals (SDGs) provokes the development of environmental, social and governance (ESG) principles (Cheema & Langa, 2022; Menezes et al., 2022; Kharazishvili et al., 2020), which is the basis for the achievement of targeted indicators within SDGs. Various initiatives have been launched to encourage companies to disclose their ESG performance, such as the Global Reporting Initiative (GRI) and the United Nations Global Compact (Taliento & Netti, 2020; Khadidja & Gachi, 2021). These initiatives helped to establish ESG reporting as a best practice for responsible corporate behaviour (Taliento & Netti, 2020). The acceptance of ESG principles has grown significantly, with a growing number of investors and companies recognising the importance of considering ESG factors in investment and business decisions. In recent years, the European Union (EU) has introduced several regulations related to ESG reporting (such as the Sustainable Finance Disclosure Regulation (SFDR) and the Non-Financial Reporting Directive (NFRD)), and ESG principals have become a mainstream approach to making decisions on investing (Chien, 2022). It should be noted that the EU is committed to promoting sustainable development and reducing the environmental impact of economic activities. Scholars (Ziabina & Dzwigol-Barosz, 2022) outline that a country's green brand can help promote sustainable development and responsible behaviour and positively impact its ESG performance. However, it is also important for countries to back up their green brand with tangible policies and practices that promote sustainability and environmental stewardship. Past studies (Skvarciany & Jurevičienë, 2021; Trushkina, 2019; Vaníčková & Szczepańska-Woszczyna, 2020; Kwilinski, 2019, 2023; Trushkina et al., 2020) confirm that digital business hasa positive impact on ESG performance by reducing carbon emissions and resource consumption. However, digital businesses also require energy-intensive data centres and may contribute to e-waste if electronic devices are not disposed of properly (Gajdzik et al., 2021; Dźwigoł, 2021b; Kuzior, 2022; Ayub Khan et al., 2022). In this case, it is necessary to identify and justify the core dimensions that could boost ESG effects at the country level. The results of the analysis showed that most scholars (Brogi et al., 2022; Huang, 2022; Trzeciak et al., 2022; Dacko-Pikiewicz, 2019; Polcyn, 2022; Letunovska et al., 2023) focused on the corporate level, eliminating the country level. Several studies (Naomi & Akbar, 2021; Mooneeapen et al., 2022; Bilyay-Erdogan, 2022; Puttachai et al., 2022; Polcyn et al., 2022; Broniewicz, 2016; Broniewicz & Dec, 2022; Dementyev et al., 2021) have focused on the analysis of ESG performance at the country level and its connections with dimensions of the country's development considering sustainable development principals. However, the findings of those studies were varied and sometimes contradictory. This study aims to analyse the ESG effect for EU countries and indemnify the core dimensions (green brand and digitalisation) to improve it. The originality of this investigation lies in its comprehensive exami-

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nation of the Environmental, Social, and Governance (ESG) effects at the country level, specifically focusing on European Union (EU) countries. While previous studies have predominantly concentrated on ESG performance at the corporate level, this research addresses the gap by extending the analysis to the national level. Thus, the paper fills the gap in the theoretical framework by developing approaches for assessing the relationship between ESG effects, a country's green brand and digital business based on the partial least squares structural equation modelling (PLS-SEM) technique. Notably, the study emphasises the significance of a country's green brand and digitalisation as core dimensions influencing ESG outcomes.

This study has the following structure: an overview of the literature – exploring the theoretical background on the relationship between ESG effects, country's green brand and digital business; research methods – explanation of the methods and methodology for checking the paper's hypothesis on linking among ESG effects, country's green brand and digital business; results of the research – describing the empirical results of the investigation; discussion – comparison analysis of the obtained findings with the previous investigations; conclusions – outlining the core research results, policy recommendation considering the findings, limitations and further direction for investigation.

An overview of the literature

The ESG principles have been around for several decades, but the specific formulation and acceptance of the principles as a framework for responsible investing and corporate governance has been more recent (Billio et al., 2021). The roots of ESG principles can be traced back to the socially responsible investing (SRI) movement of the 1970s, which sought to align investment strategies with ethical and social considerations (Bofinger et al., 2022; Garcia et al., 2017; Gillan et al., 2021; Dzwigol, 2022a, 2022b, 2023). The concept of sustainable investing also emerged during this time. In the 1990s, the term "triple bottom line" was coined to describe the idea that companies should focus not only on financial performance but also on social and environmental performance. This concept laid the groundwork for the integration of ESG factors into investment decisions (Amel-Zadeh & Serafeim, 2018). Aouadi and Marsat (2018) analysed 4000 companies from 58 countries. Considering the findings, they outline that ESG positively affects corporate value. In addition, they highlighted that the governance efficacy of the country (voice and accountability, transparency, corruption, etc.) could promote ESG effects. Singhania and Saini (2021) prove that institutional quality and legislation play a core role in increasing overall ESG performance in the country. In addition, providing transparency and accountability reduces information asymmetry among all green stakeholders. Similar conclusions were obtained by Mooneeapen et al. (2022). Based on the results of fixed effects multiple linear regression, the scholars confirmed that ESG performance was higher in countries with lower levels of democracy and political stability, while the effectiveness of corporate governance is higher in countries with better regulation quality. Analysis at the component level revealed significant differences in results across different ESG components. Furthermore, Bilyay-Erdogan (2022) analysed 21 EU countries to confirm the hypothesis that ESG performance decreases information asymmetry. The scholars proved that among ESG subindexes, only emissions, workforce, human rights, product responsibility, and management significantly and negatively affect information asymmetry. Moreover, the reverse relationship between corporate ESG performance and information asymmetry was more pronounced in civil law-oriented and stakeholder-oriented countries but not in common law-oriented and shareholder-oriented countries. Dimson et al. (2020) and Drempetic et al. (2020) indicated that investors used ESG indexes to make decisions on green investmentsin the country. At the same time, Dimson et al. (2020) showed that different ratings allow opposite results to be obtained, which causes ineffective decisions to be accepted. Lokuwaduge and Heenetigala (2017) showed that ESG should be incorporated into the development policy of the business. The scholars justified that stakeholder engagement was the core goal of environmental performance and attaining SDGs. Eliwa et al. (2021) analysed 15 EU countries within the ecological, social and governance reporting of companies. Based on empirical results, Eliwa et al. (2021) underlined the crucial role of citizens in attaining desirable social and ecological outputs.

From a macrolevel point of view, ESG refers to the assessment of a country's performance on environmental, social, and governance dimensions (Taliento & Netti, 2020). Environmental factors refer to a country's policies and practices related to climate change, pollution, natural resource management, and other environmental issues (Menezes et al., 2022; Sultana et al., 2018). Social factors include a country's performance in areas such as human rights, labour standards, healthcare, education, and social inequality (Zaloznova et al., 2020; Szczepańska-Woszczyna & Gatnar, 2022; Ramli et al., 2022; Polcyn et al., 2023; Pudryk et al., 2023; Szczepańska-Woszczyna et al., 2022). Governance factors refer to a country's political and institutional framework, including issues such as corruption, transparency, and the rule of law (Dźwigoł, 2021a; Miśkiewicz, 2021; Muradov, 2022; Nsouli, 2022). Naomi and Akbar (2021) analysed OECD countries within the relationship between natural resources, ESG effects, and economic development. ESG effects are measured using environmental, social, and governance aggregate indicators calculated by experts from the World Data Bank. Applying the path analysis model, the scholars confirmed the negative relationship between ESG performance and natural resource rents. This means that better human development inhibits corruption and promotes ESG efficiency. Based on the results of Granger causality, Naomi and Akbar (2021) prove the bidirectional causality between natural resource rent and ESG indicators. It allows us to

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conclude that ESG effectiveness will likely depend on the quality of institutions rather than the size of the economy. Good institutions allow the economy to achieve an optimal allocation of resources. Puttachai et al. (2022) applied the threshold regression model to confirm the nonlinear effects of ESG pillars on GDP per capita and energy transition in the country to carbon-free.

The concept of a country's green brand is often associated with the perception of the country's environmental performance and sustainability efforts (Chygryn et al., 2022; Us et al., 2022). A country's green brand can be built by promoting environmental policies, initiatives, and practices that enhance its natural resources and mitigate negative impacts on the environment (Ziabina & Dzwigol-Barosz, 2022; Mehraj & Qureshi, 2022). This, in turn, can positively influence the country's ESG performance. A country's green brand can directly impact its ESG performance by enhancing its environmental impact and social responsibility (Ishaq, 2021; Chygryn et al., 2022; Us et al., 2022). For instance, a country with a strong green brand may attract more investment in renewable energy and sustainable infrastructure (Us et al., 2023; Vanickova, 2020; Rozmiarek et al., 2022), which can improve its environmental impact and ESG performance. Additionally, a country's commitment to environmental policies and practices can lead to improved social responsibility, such as the protection of human rights and the promotion of sustainable practices. Scholars (Bekk et al., 2016; Mehraj & Qureshi, 2022) outline that while a country's green brand positively impacts its ESG performance, it is only one of several factors that influence sustainability outcomes. Other factors, such as economic and social conditions, political stability, and institutional capacity, also play a crucial role in shaping a country's ESG performance (Diaye et al., 2022; Yang et al., 2022).

Past studies (Nitlarp & Kiattisin, 2022; Machado et al., 2022; Miskiewicz et al., 2022, 2021) outline that Industry 4.0 provokes the penetration of digital technologies among all sectors and levels. Thus, the scholars showed that digitalisation could promote social and governance indicators of country development. However, the findings on digitalisation and environmental pillars are controversial. Scholars (Miskiewicz, 2020, 2022; Pietrzak & Takala, 2021) have shown that digitalisation positively affects the environmental efficiency of countries. At the same time, studies (Miśkiewicz, 2019; Belhadi et al., 2023; Drożdż, 2019) empirically justify that digitalisation provokes overconsumption of energy resources and e-waste accumulation. Di Natale and Cordella (2023) confirmed that ESGTech was conducive to ESG performance. At the same time, ESGTech required the relevant level of e-governance and spreading of digital business. Macchiavello and Siri (2022) also prove that digitalisation promotes ESG performance by extending fintech.

Considering the abovementioned results, this study tested the following hypothesis (Figure 1):

- **Hypothesis 1a**: the green brand of the country affects on environmental pillars,

- **Hypothesis 1b**: the green brand of the country affects on social pillars,
- **Hypothesis 1c**: the green brand of the country affects on governance pillars,
- **Hypothesis 2a**: the digitalisation effect on environmental pillars,
- **Hypothesis 2b**: the digitalisation effect on social pillars,
- **Hypothesis 2c**: the digitalisation effect on governance pillars.

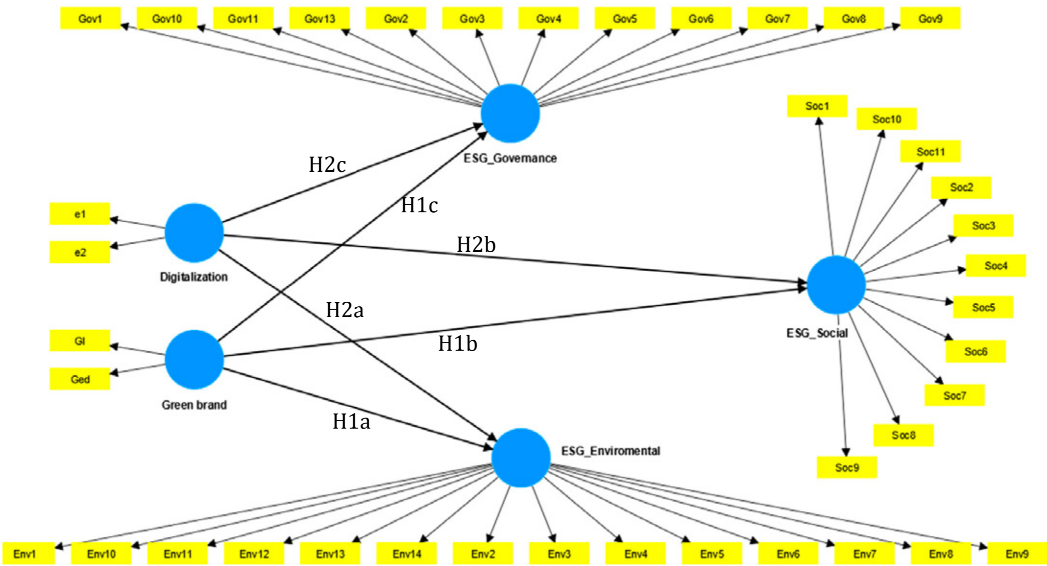

Figure 1. The research hypotheses of the study

Research methods

Based on previous studies (Naomi & Akbar, 2021; Puttachai et al., 2022), ESG performance was measured by each pillar (environmental, social and governance), which was calculated by experts of the World Data Bank (2023). The latent variable country green brand is measured by two factors: green investment and green economic growth (Kwilinski et al., 2023; Chen et al., 2023). Considering the studies (Miskiewicz, 2020, 2022), digitalisation is measured by the following indicators: enterprises with e-commerce sales, e-commerce, customer relationship management (CRM) and secure transactions.

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Table 1. Explanations of the variable for analysis

Sym-bols	Explanation	Symbols	Explanation
ESG_Social		ESG_Enviro-mental	
Soc1	Fertility rate, total (births per woman)	Env1	Agricultural land (% of land area)
Soc2	Gini index	Env2	Agriculture, forestry, and fishing, value added (% of GDP)
Soc3	Government expenditure on education, total (% of government expenditure)	Env3	CO_2 emissions (metric tons per capita)
Soc4	Income share held by lowest 20%	Env4	Cooling Degree Days
Soc5	Labor force participation rate, total (% of total population ages 15-64) (modelled ILO estimate)	Env5	Energy intensity level of primary energy (MJ/$2017 PPP GDP)
Soc6	Life expectancy at birth, total (years)	Env6	Food production index (2014-2016 = 100)
Soc7	Mortality rate, under5 (per 1,000 live births)	Env7	Forest area (% of land area)
Soc8	People using safely managed sanitation services (% of population)	Env8	Heating Degree Days
Soc9	Population ages 65 and above (% of total population)	Env9	Land Surface Temperature
Soc10	School enrollment, primary (% gross)	Env10	Level of water stress: freshwater withdrawal as a proportion of available freshwater resources
Soc11	Unemployment, total (% of total labor force) (modelled ILO estimate)	Env11	Methane emissions (metric tons of CO_2 equivalent per capita)
	ESG_Governance	Env12	Nitrous oxide emissions (metric tons of CO_2 equivalent per capita)
Gov1	Control of Corruption	Env13	Population density (people per sq. km of land area)
Gov2	GDP growth (annual %)	Env14	Renewable energy consumption (% of total final energy consumption)
Gov3	Government Effectiveness: Estimate	Green brand	
Gov4	Individuals using the Internet (% of population)	GI	Green investment
Gov5	Net migration	Ged	Green economic growth
Gov6	Political Stability and Absence of Violence/ Terrorism	Digitalization	
Gov7	Proportion of seats held by women in national parliaments (%)	e1	Enterprises with e-commerce sales
Gov8	Ratio of female to male labor force participation rate (%) (modelled ILO estimate)	e2	E-commerce, customer relationship management (CRM) and secure transactions
Gov9	Regulatory Quality: Estimate		

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Sym-bols	Explanation	Symbols	Explanation
Gov10	Research and development expenditure (% of GDP)		
Gov11	Rule of Law		
Gov12	School enrollment, primary and secondary (gross), gender parity index (GPI)		
Gov13	Voice and Accountability		

The object of investigation was EU countries for 2016-2020. Referring to previous studies (Sultana et al., 2018; Mirpanahi & Noorzai, 2021; Koh et al., 2022), this study applied the technique of the second generation of multivariate analysis, which can be considered an additional approach tocovariance-based structural equation modelling (CB-SEM) and focuses on forecasting – partial least squares structural equation modelling (PLS-SEM). In contrast to CB-SEM (which is intended for theory testing and confirmation), PLS-SEM allows forecasting and empirically justifies the research hypotheses. The core goals of this method are to maximize the explanatory variance of dependent latent constructs. In addition, PLS-SEM is an effective method for the assessment of complex models with small data samples because the relationships in the model are calculated using partial regressions.

The developed model on the relationship between ESG pillars, green brands and digitalisation contained two parts: outer та inner models. The inner model reveals the connections between latent constructs (ESG_Social, ESG_Environmental, ESG_Governance, Green brand, Digitalization). The outer model defined the connections between latent constructs and related indicators. Within this study, the connection between latent constructs and their explanatory indicators is developed in the form of reflective models:

$$X_{ij} = \alpha Y_j + \varepsilon \tag{1}$$

where:

Y_j – i-thlatent construct (ESG_Social, ESG_Environmental, ESG_Governance, Green brand, Digitalization),

X_{ij} – j-thindicator that connects with the i-th latent construct,

α – regression coefficient, which measures the strength of the relationship between the indicator and the latent variable,

ε – random error.

The core advantage of reflective models is the option to skip the indicators if the level of reliability of the structure meets the necessary conditions (Hajjar, 2018; Aburumman et al., 2022): internal consistency, reliability, and convergent and discriminant validity. The Cronbach's alpha coefficient is used to measure the internal consistency of the construct. The Cronbach's alpha coefficient provides an estimate of reliability based on mutual correlations between indicators (Kock, 2015):

$$Cronbach`s\alpha = \left(\frac{M}{M-1}\right) \times (1 - \frac{\sum_{i=1}^{M} s_i^2}{s_t^2}), \quad (2)$$

where:
s_t^2 – the variance of indicators and construct, measured via M indicators (i = 1, …, M),
s_i^2 – the variance of the sum of all M construct's indicators.

In this study, the lower thresholdfor this indicator is 0.7. However, a Cronbach's alpha coefficienthigher than 0.90 or 0.95 could indicate that all indicators measure the same phenomenon and cannot be a valid indicator of the construct. To consider the mentioned limitation, in addition to Cronbach's alpha coefficient, composite reliability is calculated as an additional indicator of internal consistency (Hair et al., 2017):

$$\rho_c = \frac{(\sum_{i=1}^{M} l_i)^2}{(\sum_{i=1}^{M} l_i)^2 + \sum_{i=1}^{M} var(e_i)}), \quad (3)$$

where:
l_i – standardised external loading of the i-th indicator and construct measured using the M indicator (i = 1, …, M),
e_i – error,
$var(e_i)$ – the variance of error.

In contrast to Cronbach's alpha, the composite reliability considers the outed loading of indicators and does not assume that they are the same in the sample; however, all indicators are equally reliable (Hair et al., 2019). The value of composite reliability from 0.7 to 0.9 is satisfactory for the interpretation of the obtained results. At the same time, values higher than 0.9 or 0.95 indicate that the indicators are almost identical and should be excluded from the research model.

The reflective model assumes that all indicators have a high proportion of variance. At the next stage, convergent validity is calculated using the AVE indicator, which represents the mean square value of all indicator loadings related to the construct (Sarstedt et al., 2019):

$$AVE = \frac{\sum_{i=1}^{M} {l_i}^2}{M}, \quad (4)$$

where:
l_i^2 – the square of the external loads of the indicators,
M – number of indicators.

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The value of AVE is acceptable if the threshold value exceeds 0.5. This means that at least 50% of the variance of the measure is explained by the construct.

The PLS-SEM algorithm applies a two-stage approach. In the first step, the study estimates the latent constructs. The next step contains the assessment of the outer weight values and loads. A necessary condition for the interpretation of the obtained results is the distinction of the model constructs from each other (Hair et al., 2018; Hair et al., 2019). The study applies two criteria (Henseler et al., 2015; Hair et al., 2021): the Fornell-Larcker criterion and the heterotrait-monotrait ratio. Appropriatediscriminant validity assumes that the construct is unique and the measure measures a phenomenon that is not represented by any other construct in the model. Using two criteria of discriminant validity of constructs is justified by the limitation of interpretation of Fornell-Larcker results if the indicator loads of the observed structures slightly differ (Ab Hamid et al., 2017). At the same time, the heterotrait-monotrait ratio allows for eliminating this shortcoming and is calculated by the formula (Hair et al., 2021):

$$HTMT_{ij} = \frac{\frac{1}{K_i K_j}\sum_{g=1}^{K_i}\sum_{h=1}^{K_j} r_{ig,jh}}{\left(\frac{2}{K_i(K_i-1)}\times\sum_{g=1}^{K_i-1}\sum_{h=g+1}^{K_i} r_{ig,jh}\times\frac{2}{K_j(K_j-1)}\times\sum_{g=1}^{K_j-1}\sum_{h=g+1}^{K_j} r_{ig,jh}\right)^{1/2}}, \qquad (5)$$

where:
r – correlation between indicators,
K_i, K_j – indicators of the i-th and j-th constructs, respectively.

An HTMT value above 0.90 or 0.85 indicates a discriminant validity issue. After confirming the validity and reliability of the structures, the next stage is the analysis of the results of the structural (internal) model. This analysis includes an assessment of the prognostic capabilities of the model and the relationships between the constructs: path coefficients and their statistical significance (p value), coefficient of determination, and effect size.

Results of the research

In the first stage, all data were measured by the range of loading factors to verify the hypotheses initially. The empirical results (Table 3) revealed the indicators that have outer loadings higher than the threshold of 0.6. These indicators were chosen for further analysis. In addition, the variance inflation factor (VIF) values for the indicators are below 5.0, indicating the absence of collinearity issues.

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Table 3. Measurement model assessment

Indicators	Outer loadings	Outer weights	VIF
Thresholds	>0.7		<5.0
Env3	0.763	0.470	1.366
Env4	0.913	0.403	4.842
Env5	0.823	0.332	4.135
Gov3	0.937	0.373	4.321
Gov4	0.819	0.288	2.778
Gov7	0.723	0.228	1.710
Gov10	0.850	0.294	2.447
Soc3	0.856	0.369	2.108
Soc5	0.920	0.439	2.561
Soc10	0.797	0.352	1.595
e1	0.979	0.514	4.120
e2	0.978	0.508	4.678
GI	0.935	0.498	2.530
Ged	0.950	0.563	2.530

The findings (Table 4) present an evaluation of the loading values for the measurement items, which demonstrates their significance and values above 0.70. According to Table 4, all constructs exhibited reliability with composite reliability (rho_a) coefficients exceeding 0.70 (Bell et al., 2023). The average variance extracted (AVE) was employed to assess convergent validity. An AVE value above 0.50 is necessary to ensure that the variance in the construct is not dominated by measurement error and that at least 50% of the measurement variance is accounted for (Hair & Alamer, 2022). The results revealed that the AVEs were above 0.50, providing evidence of convergent validity (Hair & Alamer, 2022).

To ensure the validity of the study's findings (Table 5), a Fornell-Larcker criteriontest was conducted (Purwanto & Sudargini, 2021). This test involved comparing the square roots of the average variance extracted (AVE) with the correlation between latent variables following a specific algorithm (Purwanto & Sudargini, 2021). If the square root of AVE for a construct is greater than the correlation between that construct and another construct, it indicates discriminant validity. Furthermore, the HTMT values do not exceed the threshold value for all constructs, and its value is below 0.90. The empirical findings, as presented in Table 5, confirm that the criteria for discriminant validity have been met.

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Table 4. Construct reliability and validity of the model

Construct	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	AVE
Cutt-Off Level	>0.7	>0.7	>0.7	>0.5
ESG_Enviromental	0.784	0.789	0.873	0.698
ESG_Governance	0.854	0.888	0.902	0.698
ESG_Social	0.821	0.838	0.894	0.738
Green brand	0.841	0.875	0.884	0.888
Digitalization	0.835	0.856	0.878	0.957

Table 5. Discriminant validity of the model

Construct	Digitalization	ESG_Enviromental	ESG_Governance	ESG_Social	Green brand
Heterotrait-monotrait ratio					
Digitalization					
ESG_Enviromental	0.697				
ESG_Governance	0.638	0.820			
ESG_Social	0.748	0.812	0.839		
Green brand	0.787	0.835	0.845	0.834	
Fornell-Larcker criterion					
Digitalization	0.878				
ESG_Enviromental	-0.602	0.835			
ESG_Governance	0.588	-0.727	0.836		
ESG_Social	0.664	-0.639	0.746	0.859	
Green brand	0.713	-0.801	0.822	0.763	0.843

Table 6 displays the outcomes of the country's green brand and digitalisation impact on each ESG pillar. The results show that the path coefficient for Hypothesis 1a is -0.755, which means that the growth of a country's green brand provokes improving environmental pillar within the declining CO2 emissions, cooling degree days, and energy intensity level of primary energy. Furthermore, country green brands positively affect social and governance pillars. The path coefficients are 0.588 and 1.023, respectively. The findings show that the p-value is 0.000, which confirms H1a, H1b, H1c and H2c. The graphical visualisation of the PLS-SEM results for the analysed hypotheses is shown in Figure 2.

Table 6. Structural model results

Hypotheses		Path coefficient	T values	P value	Supported
Hypothesis 1a	green brand – environmental pillars	-0.755	8.413	0.000	Yes
Hypothesis 1b	green brand – social pillars	0.588	6.829	0.000	Yes
Hypothesis 1c	green brand – governance pillars	1.023	9.748	0.000	Yes
Hypothesis 2a	digitalization – environmental pillars	-0.064	0.883	0.377	No
Hypothesis 2b	digitalization –social pillars	0.244	1.054	0.292	No
Hypothesis 2c	digitalization – governance pillars	0.142	2.670	0.008	Yes

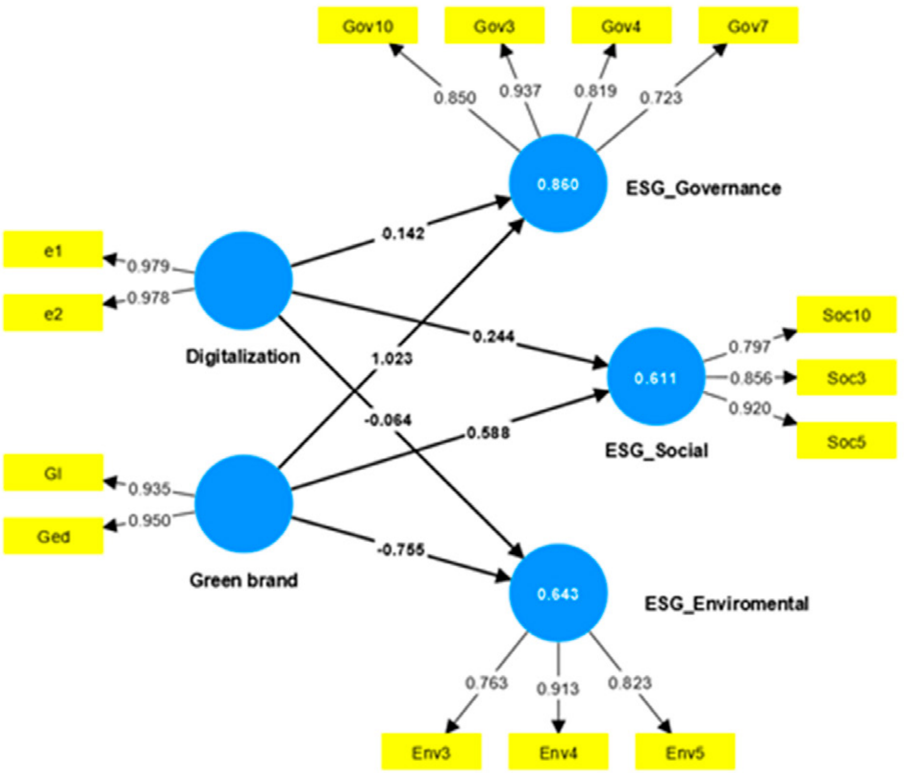

Figure 2. Visualisation of PLS-SEM results for the analysed hypotheses

Digitalisation (which is measured by enterprises with e-commerce sales, e-commerce, CRM and secure transactions) positively affects the governance pillar. The growth of digitalisation by one point is conducive to improving the government pillar by 0.142. However, the finding allows for the rejection of H2a and

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H2b, and the p-value is not statistically significant. This confirms that digitalisation could have a nonlinear effect on environmental and social pillars.

Conclusions & Discussion

This study analysed the relationship between ESG pillars, a country's green brand and digitalisation. The findings showed that increasing ESG pillars could be caused by promoting green brands and extending digitalisation. Thus, the growth of green brands provokes the increasing social pillar – by 0.588, governance – by 1.023 (the highest impact among the analysed variables). It should be noted that the growth of country green brands led to a decline in environmental pillars by 0.755. It shows that improving the country's green economic development and green investment allows declining CO_2 emissions, limiting the cooling degree days and energy intensity level of primary energy. These conclusions are consistent with those of past studies (Menezes, 2022; Cheema & Langa, 2022; Sultana et al., 2018). Furthermore, digitalisation positively affects all ESG pillars. However, its impacts on environmental and social pillars are not statistically significant. It should be noted that the growth of enterprises with e-commerce sales and e-commerce, CRM, and secure transactions could not affect CO2 emissions, the cooling degree days, or the energy intensity level of primary energy. This is contradictory to past studies (Nitlarp & Kiattisin, 2022; Machado et al., 2022; Miskiewicz et al., 2021, 2022) that empirically confirm that digitalisation allows declining CO_2 emissions and energy intensity.

Considering these findings, several policy implications emerge, urging governments to enhance ESG pillars through improvements in green branding and digitalisation. Environmental policies should be fortified, incorporating modernisation regulations and incentives to foster sustainable practices, including emissions reduction, biodiversity protection, and sustainable development. Governments should intensify green investments in renewable energy, fostering sustainable energy production and bolstering the country's green brand. Encouraging the adoption of eco-friendly transportation, waste management, and sustainable urban planning is crucial for reducing environmental impacts and promoting social responsibility. Additionally, governments should actively promote digitalisation by investing in digital infrastructure, improving literacy, and supporting innovation in digital technologies. This not only enhances the green brand but also improves environmental monitoring, resource management, and stakeholder engagement. Furthermore, obligatory regulations incentivising sustainable business practices and engaging stakeholders in the sustainability agenda are vital for achieving transparent, accountable, and participatory governance, essential components of ESG performance.

It should be noted that ESG performance is improved by promoting green brands, extending digitalisation, and enhancing the country's sustainability per-

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formance. These policies attract investment in sustainable industries and support the growth of the green economy, contributing to a more sustainable future.

Despite the valuable findings, this study has a few limitations. Thus, this study analysed the linear impact of digitalisation and green brands on ESG pillars. However, further investigations should analyse the nonlinear connections between the variables. In addition, in this study, the green brand is measured by two variables, green investment and green economic development, which limit the consideration of other dimensions (green innovations, knowledge, etc.). A similar issue with the latent variable – digitalisation. In future investigations, it is necessary to extend the list of variables that impact digitalisation. In addition, ESG pillars are closely related to the awareness and SDG achievement of the country, which should be incorporated into further study. At the same time, further study requires analyses of the role of globalisation and the democratic profile of the country, which could significantly intensify or restrict the development of the country's green brands and ESG pillars.

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The contribution of the authors

Conception, A.K., O.L. and T.P.; literature, A.K., O.L. and T.P.; acquisition of data, A.K., O.L. and T.P.; analysis and interpretation of data, A.K., O.L. and T.P.

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ROLA ZIELONEJ MARKI KRAJU I CYFRYZACJI W ZWIĘKSZENIU EFEKTYWNOŚCI ŚRODOWISKOWEJ, SPOŁECZNEJ I ZARZĄDCZEJ

STRESZCZENIE: W obecnym globalnym krajobrazie, charakteryzującym się rosnącymi obawami dotyczącymi zmian klimatycznych, zrównoważonego rozwoju i odpowiedzialności korporacyjnej, istnieje potrzeba zbadania bieżących kwestii na przecięciu świadomości ekologicznej, postępu technologicznego i praktyk zarządzania. Celem niniejszej pracy jest określenie zależności pomiędzy środowiskowymi, społecznymi i zarządczymi (ESG) filarami rozwoju kraju, zieloną marką i cyfryzacją. Do realizacji celu badania zastosowano modelowanie równań strukturalnych metodą częściowych najmniejszych kwadratów (PLS-SEM). Obiektem badania były kraje Unii Europejskiej w latach 2016-2020. Wyniki badań pozwalają stwierdzić, że zielona marka kraju sprzyja wynikom ESG poprzez przyciąganie zielonych inwestycji w odnawialne źródła energii, projekty społeczne i innowacje. Wyniki potwierdzają, że rządy powinny nadać priorytet inicjatywom zrównoważonego rozwoju, takim jak inwestowanie w energię odnawialną, przyjmowanie zrównoważonych praktyk oraz wdrażanie polityki środowiskowej i społecznej. Takie działania mogą wzmocnić zieloną markę kraju i doprowadzić do pozytywnych wyników ESG, przyciągając bardziej odpowiedzialne firmy i inwestorów. Ponadto, cyfryzacja promowała zarządzanie o 0,142. Wyniki pokazały, że cyfryzacja może być potężnym narzędziem do poprawy zielonej marki kraju i wyników ESG. Technologie cyfrowe mogą pomóc krajom monitorować i zarządzać zasobami środowiskowymi, promować zrównoważone praktyki i angażować się w relacje z interesariuszami.

SŁOWA KLUCZOWE: ujawnianie informacji o społecznej odpowiedzialności przedsiębiorstw, rozwój zrównoważony, zanieczyszczenie środowiska, efektywne zarządzanie, zarządzanie rozwojem

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