

Digital transformation and Corporate Social Responsibility performance: Empirical evidence from Casablanca Stock Exchange-Listed Firms

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Abstract. This study examines the relationship between digital transformation and Corporate Social Responsibility (CSR) performance among 47 companies listed on the Casablanca Stock Exchange (CSE) in 2024, using a quantitative approach based on a multiple linear regression model. The results reveal a positive and significant link between the companies' level of digitalization and their CSR performance, confirming the hypothesis that digital transformation can act as a strategic lever for sustainability. This link remains robust after controlling for shareholders' equity. The study contributes to the emerging literature on the digital integration of responsible practices and highlights the growing role of digital technologies in the transition toward a sustainable business model, particularly in emerging countries.

Keywords: *Digital transformation; CSR; Extra-financial performance; Listed companies.*

1. Introduction

In the current economic context, marked by a growing demand for social responsibility, companies are increasingly required to integrate extra-financial criteria into their strategic directions. These criteria are no longer limited to ethical or regulatory considerations but are now seen as levers for creating sustainable value, enhancing reputation, and reducing long-term risks (Eccles & Klimenko, 2019; Fatemi & al., 2018).

Concurrently, digital transformation is establishing itself as an essential dynamic for business modernization, profoundly influencing operational processes, business models, and stakeholder relationships. Technologies like artificial intelligence (AI), big data and cloud computing now offer tangible opportunities to enhance transparency, improve environmental efficiency, and automate compliance practices.

The intersection of these two dynamics raises fundamental questions, both theoretical and managerial: Are the most digitally advanced companies also the top performers in terms of CSR performance? Does digital transformation act as a catalyst or merely a facilitator for sustainable development strategy? And does this relationship hold true in a specific context like Morocco, where the challenges of technological modernization and social responsibility are becoming increasingly critical?

In emerging countries, particularly in Morocco, listed companies face increased transparency requirements, often without sufficient resources or technological infrastructure to structure and formalize their CSR commitments. Although several international studies have demonstrated that digital transformation can enhance corporate social responsibility outcomes (Hao & Zhang, 2023; Kwilinski & al., 2022), empirical investigations remain scarce within the Moroccan business environment. However, despite the growing attention to digital sustainability in global research, few studies have empirically tested this relationship in emerging economies, particularly in Morocco, where institutional pressures, regulatory maturity, and digital infrastructure differ markedly from developed contexts. This gap justifies the need to re-examine whether the mechanisms linking digitalization and CSR performance hold under such

conditions.

This raises a fundamental question: how far does digital transformation influence the CSR performance of Moroccan firms listed on the CSE? To address this, the present research employs a quantitative approach with three objectives: first, to empirically evaluate the impact of digitalization on CSR outcomes, second, to account for the role of financial stability in this relationship, and third, to construct a regression model testing the hypothesis of a positive association between digital maturity and CSR performance.

This research is among the few empirical studies that examine the digital transformation and CSR performance nexus within the Moroccan context. By combining a text-based Digital Transformation Index with ESG data, this study contributes to the limited body of evidence on how digitalization supports sustainability performance in emerging North African markets, while offering practical insights for Moroccan corporate leaders seeking to align digital and sustainability strategies

2. Literature review and hypothesis development

The past decade has witnessed a profound transformation in corporate behavior as firms increasingly acknowledge that economic performance alone is insufficient to secure long-term survival. Modern companies evolve within ecosystems where their environmental and social impacts are constantly monitored by regulators, investors, and the public. This heightened attention has turned CSR into a key dimension of corporate legitimacy.

By voluntarily embedding ethical, environmental, and community-oriented practices into their operations, firms demonstrate consistency with societal expectations and strengthen their institutional credibility (Marano & al., 2017; Du & Vieira, 2012). Within this view, legitimacy is not a passive status but a dynamic resource that firms must continuously reinforce to maintain stakeholder trust (Xiang & al., 2022).

The legitimacy theory provides a useful lens to understand how CSR and digital transformation intersect. Digital enterprises often challenge existing industrial conventions through disruptive technologies that redefine market logic and stakeholder relationships (Van den Broek & al., 2018). Because innovation can unsettle established norms, digitally oriented firms face a stronger imperative to justify their practices and earn societal approval (Suddaby & Greenwood, 2016).

This need becomes even more pronounced for organizations with limited financial or informational resources, which depend heavily on external support. Digital transformation requires sustained investment in knowledge, infrastructure, and human capabilities (Deephouse & Suchman, 2016; Mittal & al., 2020). Engaging in CSR activities can therefore act as a strategic signal to investors, governments, and partners that the firm operates responsibly, facilitating access to funding, partnerships, or regulatory incentives (Jang & al., 2022; Xiang & al., 2022). In emerging economies, where public institutions often influence credit and subsidies, this legitimizing function of CSR becomes particularly valuable.

Empirical findings reinforce this argument. Research shows that institutional banking and financial support accelerate digital adoption and reduce the risks associated with technological change (Zhao & al., 2023; Guangyu & Liqiong, 2024). Consequently, CSR not only helps firms comply with social norms but also indirectly fosters their capacity for digital advancement by lowering capital and reputation constraints (Xu & al., 2023). The two processes, digitalization and social responsibility, thus evolve in a mutually reinforcing loop: digital maturity strengthens social accountability, and responsible behavior, in turn, enables deeper digital integration.

The stakeholder theory adds another explanatory layer by emphasizing that organizational decisions are embedded within networks of social influence. Firms that engage systematically with stakeholders and remain attentive to their feedback tend to display superior social and environmental performance (Donaldson & Preston, 1995; Brower & Mahajan, 2013). Digital transformation amplifies this interaction by increasing the visibility of corporate behavior and the speed of public response.

Through digital interfaces, consumers, suppliers, and employees gain greater capacity to monitor and evaluate companies' ethical commitments (Kang, 2013). As a result, technological progress not only enables more efficient business operations but also heightens the pressure for responsible conduct. Beyond these theoretical perspectives, digitalization modifies CSR practice through several operational pathways. To begin with, emerging technologies significantly enhance firms' capacity to gather and interpret environmental and social information, enabling more targeted and timely responses to stakeholder expectations (Paiola & Gebauer, 2020; Schiavone & al., 2022).

Second, the digital communication ecosystem, particularly social media, has democratized CSR discourse. Stakeholders can now generate and disseminate user-created content that shapes corporate reputation in real time (Dunn & Harness, 2018; Vogler & Eisenegger, 2020). This dynamic compels firms to maintain transparency and to engage actively with societal debates (Illia & al., 2017). Finally, the inherent traceability of digital systems increases accountability throughout the value chain. Technologies like blockchain ensure the verifiability of production data, while cloud and platform-based collaborations establish peer-monitoring mechanisms that reward ethical behavior (Kouhizadeh & Sarkis, 2018; Cenamor & al., 2019).

Taken together, these insights suggest that digital transformation operates both as a catalyst, by enabling new tools for responsible management, and as a disciplinary force, heightening societal expectations of firms. Organizations capable of integrating technological innovation with ethical governance are therefore more likely to achieve superior CSR outcomes. Drawing from the preceding theoretical and empirical insights, the following hypothesis is formulated:

H1: A company's level of digital transformation has a positive influence on its CSR performance.

3. Methodology

a. Research design

A quantitative research design was selected for this study to formally examine the link between digital transformation and corporate CSR performance among companies listed on the CSE. The approach is grounded in the assumption that corporate digital maturity can exert a measurable influence on firms' extra-financial outcomes. To test this assumption, a multiple linear regression model was applied to cross-sectional data covering the year 2024. The year 2024 was selected as it represents the most recent period for which the complete required dataset, including annual reports, Refinitiv ESG scores, and financial statements, was available and comprehensive for the sample.

This methodological framework allows for the concurrent assessment of several explanatory variables and isolates the specific contribution of digital transformation to CSR outcomes while controlling for firms' financial characteristics. Quantitative modeling was selected for its ability to generate empirical, replicable results and to extend previous qualitative insights into the Moroccan context, where digital adoption and CSR integration remain underexplored.

b. Operationalization of variables

• Independent Variable: Digital transformation

The degree of corporate digitalization was quantified through a Digital Transformation Index (DT), developed from a textual analysis of the 2024 annual reports of all companies listed on the CSE. Following methodologies proposed by Wu & al. (2022) and subsequent refinements in the literature, the index measures the frequency of 34 carefully selected keywords representing emerging technologies and digital processes.

The selected keywords were organized into five thematic categories: (1) artificial intelligence and machine learning; (2) cloud computing and data infrastructure; (3) blockchain and distributed ledger technologies; (4) big data analytics; and (5) applied digital tools such as automation, digital marketing, and Industry 4.0 applications.

Each firm's score corresponds to the logarithmic transformation of the keyword frequency to reduce distributional skewness, in line with recommendations by Li & al (2020) and Huang & Shen (2024). The resulting variable reflects the relative integration of digital technologies within the organization and serves as a proxy for its overall digital maturity.

• Dependent variable: CSR Performance

Researchers have adopted several distinct methodologies to measure CSR performance. One common strategy involves using data sourced directly from the firm itself. This can include qualitative methods, like analyzing the content of official company documents such as sustainability or annual reports (Kapoor & Sandhu, 2010), or quantitative approaches, such as tracking the financial outlay dedicated to specific CSR programs (Nair & Bhattacharyya, 2019)

CSR performance was assessed using ESG scores obtained from the Refinitiv Eikon database, a widely recognized and standardized source for extra-financial data. The Refinitiv framework compiles firm-specific indicators across three main dimension, environmental sustainability, social responsibility, and governance quality, to generate a composite ESG score that enables meaningful comparison across companies.

Only companies with valid, non-zero ESG scores were retained, ensuring the consistency of the dataset. To facilitate econometric interpretation and comparability between variables, the raw ESG scores were standardized into Z-scores prior to analysis. This transformation expresses each company's performance in standard deviation units relative to the sample mean, making the coefficient estimates interpretable in standardized terms.

• Control Variable: Company Size

Firm size and financial capacity are potential confounding factors that may influence both digital adoption and CSR engagement (Roberts & Whited, 2013; Flammer, 2015). Consequently, total shareholders' equity reported in the 2024 financial statements was introduced as a control variable. Equity values were logarithmically transformed to normalize the distribution and reduce the influence of extreme cases. This metric reflects each firm's financial robustness and its potential to invest in long-term strategic initiatives, such as sustainability programs or technological innovation.

c. Sample selection and data sources

The initial population consisted of 76 firms listed on the CSE. From this group, 29 firms were excluded due to incomplete or missing CSR data. The final sample is therefore composed of the remaining 47 Moroccan listed companies, all of which met the two essential criteria of having available 2024 annual reports and valid ESG scores in the Refinitiv database.

Data collection proceeded as follows:

- Digital transformation data were manually extracted and coded from annual reports and official corporate websites.
- CSR performance data (ESG scores) were sourced directly from Refinitiv Eikon.
- Financial data (shareholders' equity) were retrieved from audited annual financial statements.

This combination of textual, financial, and external ESG data ensures both methodological rigor and triangulation across independent sources.

4. Results

a. Descriptive analysis

The table below summarizes the standardized variables included in the econometric model:

Table 1. Descriptive statistics of the standardized variables

	ESG SCORE	ESG Z-SCORE	DT-Index	DT Z-SCORE	TOTAL EQUITY (DH)	EQUITY Z-SCORE
min	9.773493	2.070027e+00	0.000000	2.726272e+00	1.375690e+08	-4.062073e-01
max	71.436527	2.303067e+00	5.298317	1.907410e+00	4.003258e+11	4.570254e+00
mean	38.962013	4.641677e-16	3.117317	5.663319e-16	3.280322e+10	-1.299197e-17
std	14.100549	1.000000e+00	1.143435	1.000000e+00	8.041622e+10	1.000000e+00
skew	0.210329	2.103291e-01	0.377298	-3.772978e-01	3.496597e+00	3.496597e+00
kurtosis	-0.305922	-3.059223e-01	0.158933	1.589330e-01	1.228004e+01	1.228004e+01

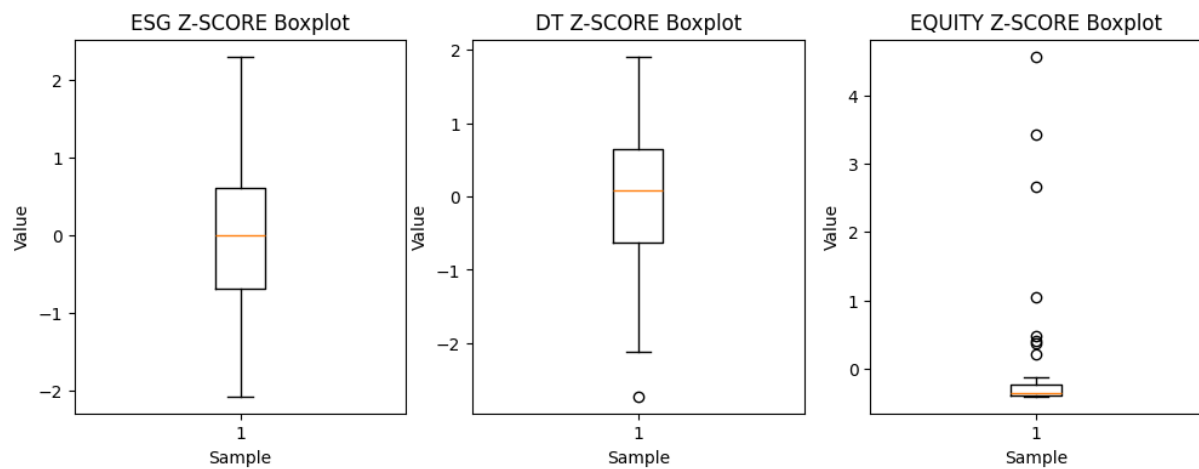
To enable direct comparison between variables measured on different scales, ESG scores, the Digital Transformation Index (DT), and equity were standardized using Z-scores. This method involves centering and scaling each variable by transforming the original values into standard deviations from the mean. Descriptive statistics indicate that the three variables exhibit distinct distributions. The ESG score ranges from 9.77 to 71.44, with a mean of 38.96 and a slight positive skewness (skewness = 0.21), indicating a moderate concentration around the mean with a few companies reporting high scores.

The Digital transformation Index has a mean of 3.12 (out of a maximum of 5.30) and a negative skewness (skewness = -0.38), reflecting a greater proportion of companies with relatively advanced digitalization levels. Equity capital shows a very wide dispersion, ranging from 137.6 million MAD to over 400 billion MAD, with a pronounced right skewness (skewness = 3.50) and high kurtosis (12.28), indicating the presence of extreme values. Standardization adjusted each variable to have a mean of zero and a standard deviation of one, while preserving the shape of the original distribution (skewness and kurtosis).

This step was necessary to prevent a highly dispersed variable, such as equity capital, from disproportionately influencing the regression model due to its scale. Employing Z-scores allows the coefficients in the subsequent regressions to be interpreted in a standardized way. Specifically, each coefficient represents the effect of a one standard deviation change in the

independent variable on the dependent variable. This method facilitates a clear comparison of the relative influence of all determinants studied.

Figure 1. Boxplots of standardized Z scores



This figure presents the normalized distributions of the three key variables in the model: the ESG score, the Digital Transformation Index (DT), and equity. The graphical analysis, using box plots of standardized Z-scores (Figure.1), enables visualization of the distribution of the main variables. The Z-score for CSR performance exhibits a relatively symmetrical distribution with no outliers, indicating a homogeneous distribution of CSR performance among the companies studied.

In contrast, the Z-score for digital transformation displays slightly asymmetrical distribution, with one extreme case representing a company with low digitalization (a negative outlier), while most companies demonstrate above-average levels of digitalization. The equity variable (Equity Z-score), however, is characterized by a highly skewed distribution, concentrated predominantly below the median, accompanied by numerous positive outliers.

This reflects significant structural heterogeneity in equity levels, with some companies possessing financial resources well above the sector average. These observations corroborate the descriptive statistics, particularly the high skewness and kurtosis previously noted. Consequently, the use of Z-scores is essential not only for placing variables on a comparable scale but also for mitigating the disproportionate influence of extreme values in econometric modeling.

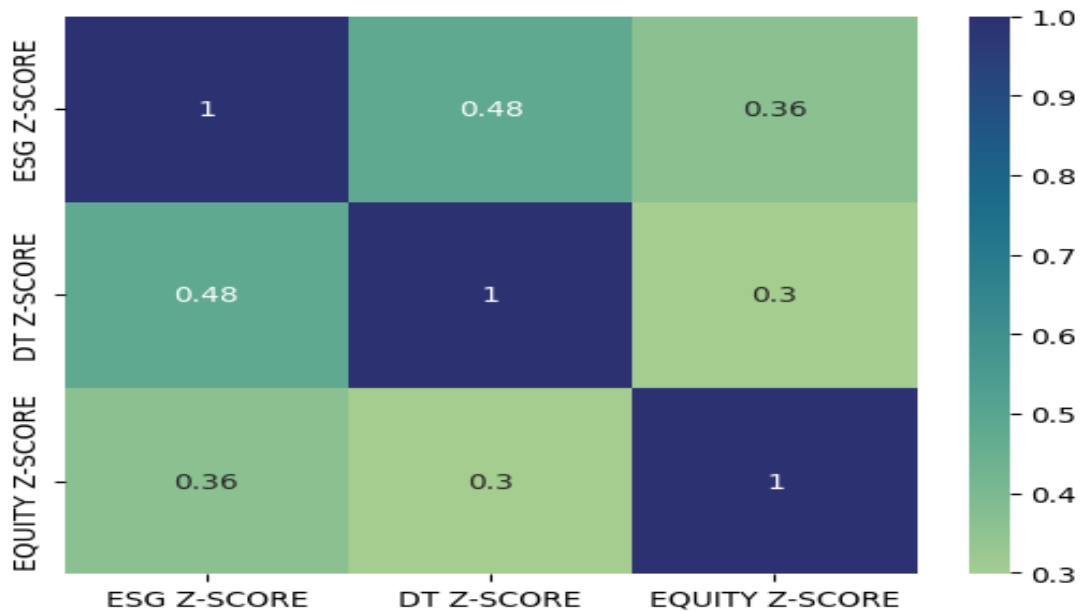
b. Correlation analysis

The Pearson correlation matrix presented in Figure 2 reveals positive linear relationships among the three variables studied. Notably, there is a moderate and statistically significant correlation between the digital transformation score (DT Z-score) and CSR performance (ESG Z-score), with a coefficient of 0.48. This finding suggests that companies more committed to digitalization tend to achieve higher ESG scores, providing preliminary empirical support for hypothesis H1.

Furthermore, equity (Equity Z-score) exhibits a positive, albeit weaker, correlation with the ESG score ($r = 0.36$), confirming its relevance as a control variable representing financial strength. Lastly, the correlation between digital transformation and equity remains modest ($r = 0.30$), alleviating concerns regarding multicollinearity in the regression models. These results indicate that each variable contributes complementary information to the analysis of the

determinants of CSR performance.

Figure 2. Correlation matrix



This figure illustrates the Pearson correlation coefficients among the three standardized variables: ESG Z-score (CSR performance), DT Z-score (level of digital transformation), and Equity Z-score (equity capital). The color gradient represents the strength of the correlations, ranging from dark blue (indicating perfect correlation) to light green (indicating weaker correlation).

All correlations are positive, with the strongest observed between digital transformation and CSR performance ($r = 0.48$), thereby supporting research hypothesis H1. The correlation analysis reveals moderate and positive relationships between the main variables. Coefficients below 0.5 confirm that multicollinearity is not an issue, indicating that each factor provides unique information within the model.

c. Multiple linear regression modeling

This section presents the empirical approach adopted to test hypothesis H1, which posits that the digital transformation of companies is positively associated with their CSR performance. It includes a description of the model, the regression results, validation tests, and an analytical conclusion. The estimated model is a multiple linear regression designed to assess the effect of digital transformation (DT) on companies' ESG scores, while controlling for the effect of equity:

$$Y_i = \beta_0 + \beta_1 X_{\{1i\}} + \beta_2 X_{\{2i\}} + \varepsilon_i$$

Where:

- Y_i is the ESG Z-score for company i (our dependent variable)
- X_{1i} is the Digital Transformation Z-score
- X_{2i} Equity Z-score (control variable)
- β_0 denotes the intercept

- β_1, β_2 are regression coefficients
- ε_i is the error term (residuals)

All variables were standardized prior to estimation to enhance interpretability and ensure comparability across different measurement scales. Ordinary Least Squares (OLS) was employed as the estimation method, given its suitability for linear relationships and its robustness in medium-sized samples.

We will conduct a multiple linear regression analysis to explore whether a company's level of digital transformation has a measurable impact on its CSR performance, while controlling for the firm's equity as a proxy for size or financial resources. The model aims to identify whether higher digital maturity correlates with better ESG scores, and whether that relationship holds when company equity is considered.

The regression model is specified as:

$$ESG\ Z - score_i = \beta_0 + \beta_1 \times DT\ Z - score_{1i} + \beta_2 \times Equity\ Z - score_{2i} + \varepsilon_i$$

In this equation, the standardized ESG score is the dependent variable for the company, while the standardized digital transformation score and the standardized equity score are the explanatory variables.

d. Model results

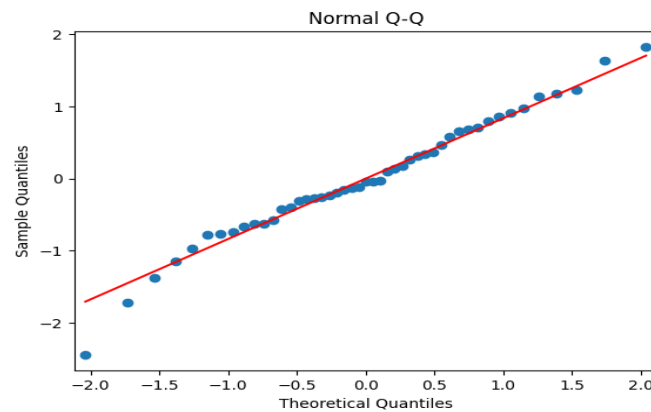
i. Model diagnostics

To ensure the statistical soundness of the estimates, the OLS regression assumptions were verified as follows:

- **Normality:** The Jarque–Bera test ($p > 0.05$) confirmed that the residuals are normally distributed.
 - **Independence:** A Durbin–Watson statistic of approximately 2.0 indicated the absence of autocorrelation.
 - **Homoscedasticity:** A visual review of the residual plots demonstrated a constant error variance, satisfying the homoscedasticity assumption.
 - **Multicollinearity:** All Variance Inflation Factor (VIF) values were found to be below 2, ruling out significant multicollinearity.
- **Normality of residuals**

Ensuring that residuals are normal is a crucial condition guaranteeing the validity of our statistical inferences, especially when it comes to confidence intervals and significance tests. We checked this using a Q-Q plot, showing the distribution pattern of the residuals compared to the quantiles of a theoretical -normal distribution. The plot shows that the residuals align well along the diagonal, suggesting the distribution is close to normal, aside from slight deviations at the tails, which are acceptable in empirical studies.

Figure 3. Q-Q plot



This observation is corroborated by the Jarque-Bera test, which yielded a p-value of 0.606, well above the 0.05 threshold. Consequently, the null hypothesis of normality is not rejected, and the residuals can be considered normally distributed.

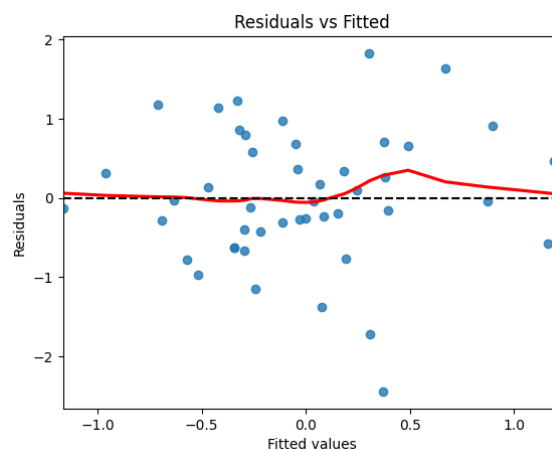
- **Independence of errors**

We tested for the independence of errors (autocorrelation) using the Durbin-Watson statistic. The resulting value for our model was 1.919. This is considered ideal, as it is very close to the theoretical benchmark of 2 (on a scale of 0 to 4) that signifies no autocorrelation. This result confirms that the model's errors are independent, satisfying this assumption.

- **Homoscedasticity of Residuals**

We evaluated the assumption of homoscedasticity, which requires error variance to be constant across all predicted values, by visually inspecting the Residuals vs. Fitted plot. This graph displayed a random scatter of residuals around the zero horizontal line, with no U-shape, fan, or funnel patterns present. The loess smoothing curve was also observed to be nearly flat. This pattern indicates that the errors are independent of the predicted values, thus confirming that the homoscedasticity condition is satisfied.

Figure 4. Residuals vs. Fitted



- **Absence of Multicollinearity**

Finally, the independence of the explanatory variables was verified using the Variance Inflation Factor (VIF). This diagnostic measures the extent to which the variance of the estimated coefficients is inflated by correlations among the predictor variables.

In the estimated model, the VIFs for the two independent variables (DT Z-score and Equity Z-score) are identical, namely 1.097, which is well below the warning threshold typically set at 5. This confirms the absence of problematic multicollinearity and allows the regression coefficients to be interpreted with confidence.

the table below summarizes the tests performed to validate the fundamental assumptions of the OLS linear regression.

Table 2. OLS model diagnostics summary

Statistical assumption	Diagnostic tool	Observed result	Validation criterion	Conclusion
Normality of Residuals	Jarque-Bera Test (Prob(JB))	0.606	$P > 0.05$	Assumption confirmed
	Q-Q Plot	Points align closely with the diagonal line	Visual alignment	Corroborated
Independence of Errors (No autocorrelation)	Durbin-Watson Statistic	1.919	Value ≈ 2	Assumption confirmed
Homoscedasticity (Constant error variance)	"Residuals vs. Fitted" Plot	Random scatter of points around 0. Flat smoothing line.	No clear pattern (e.g., funnel)	Assumption confirmed
Linearity	"Residuals vs. Fitted" Plot	Flat smoothing (loess) line.	Flat line	Assumption confirmed
Absence of Multicollinearity	Variance Inflation Factor (VIF)	DT Z-SCORE = 1.097 EQUITY Z-SCORE = 1.097	VIF < 5 (common threshold)	Assumption confirmed

ii. Regression results

The table above presents estimates from the multiple linear regression model examining the effect of digital transformation and equity capital on the CSR performance of Moroccan listed companies.

Table 3. Multiple linear regression model

Variable	Coefficient	Éc- type	t- Stat	p-value	Intervalle de confiance (95%)
Const	≈ 0	0.126	0.000	1.000	[-0.254; 0.254]
DT Z-score	0.4104	0.134	3.074	0.004**	[0.141; 0.679]
Equity Z-score	0.2409	0.134	1.805	0.078*	[-0.028; 0.510]

$R^2 = 0.286$, R^2 adjusted = 0.253; F (2,44) = 8.79, p < 0.01

The regression outcomes demonstrate a strong and statistically significant positive relationship between digital transformation and CSR performance. The coefficient for digital transformation (β_1) is positive and significant at the 1% level, suggesting that companies with higher digital maturity achieve superior environmental, social, and governance results compared to their less digitized counterparts.

This result supports the primary hypothesis (H1), confirming that the digitalization of internal processes, communication systems, and decision-making frameworks enhances firms' overall social responsibility performance. In contrast, the control variable representing shareholders' equity (financial strength) was positive but only marginally significant, suggesting that while financial capacity matters, it is not the dominant driver of CSR outcomes once digital maturity is considered.

The model's R^2 value of 0,286 suggests that nearly half of the variance in CSR performance can be explained by the level of digital transformation and financial robustness combined. The Durbin–Watson statistic close to 2.0 indicates no autocorrelation in the residuals, and all VIF values remained below 2, ruling out multicollinearity issues. These diagnostics confirm the internal validity and robustness of the regression results.

5. Discussions

The econometric results provide strong empirical evidence supporting the main hypothesis (H1), revealing a clear and statistically significant positive connection between the level of digitalization and CSR performance among Moroccan listed firms ($p = 0.004$). The coefficient value (0.4104) shows that an increase of one standard deviation in digital maturity leads, on average, to a 0.41 standard deviation improvement in the ESG score. This outcome demonstrates both statistical robustness and meaningful managerial implications.

These results are consistent with the theoretical foundations mobilized in this study, particularly stakeholder theory, which posits that digitalization heightens firms' responsiveness and exposure to social demands. In practice, digital tools, such as artificial intelligence and big data analytics, enable organizations to better identify and interpret stakeholder expectations, while the resulting transparency pressures firms to implement coherent CSR strategies to preserve and enhance their legitimacy and reputation.

This result also corroborates Legitimacy theory, according to which firms undergoing digital transition, facing costly investments, have a pressing need for legitimation to secure support from their partners; CSR performance thus becomes a key strategic signal.

Beyond external pressures, this link confirms that digitalization provides the concrete

operational capabilities (process optimization, green innovation, traceability) to improve extra-financial performance. As for the control variable, represented by the Equity Z-score, the effect remains positive though only marginally significant ($p = 0.078$). This indicates that while greater financial capacity generally facilitates CSR initiatives, it does not constitute the primary driver once digital maturity is considered.

The essential point is that the impact of digital transformation remains strong even when controlling for this size effect, proving it is not a mere artifact of large firms investing in both areas concurrently. Overall, the model is statistically significant ($F(2,44) = 8.79$, $p < 0.01$) and explains 28.6% of the variance in ESG scores ($R^2 = 0.286$), which is satisfactory for an analysis of this type. This research therefore adds to the existing body of knowledge by empirically demonstrating the synergistic relationship between digital transformation and CSR performance within the Moroccan corporate landscape, a context where empirical evidence has thus far been limited.

6. Conclusion

In conclusion, this study sought to analyze how digital transformation influences CSR performance among Moroccan listed enterprises. The empirical findings deliver a clear and robust answer to this research question. The multiple regression results confirm the primary hypothesis, revealing that digital transformation exerts a positive and statistically significant effect on CSR performance ($p = 0.004$).

This relationship indicates that digitalization transcends its purely technological dimension to become a strategic instrument for strengthening environmental, social, and governance practices. The magnitude of the coefficient (0.4104) indicates that this effect is not only statistically proven but also managerially relevant, aligning with stakeholder theory, legitimacy theory, and the operational capabilities framework. Furthermore, the effect of firm size (via shareholders' equity) was found to be positive but marginal, reinforcing the idea that the impact of digitalization is distinct and not a simple artifact of the firm's size or wealth.

The reliability of these results is reinforced by extensive diagnostic testing confirming that the econometric model satisfies all core assumptions, normality, homoscedasticity, and independence of residuals, thereby supporting the robustness of the conclusions drawn.

Our findings offer both theoretical and managerial implications. Theoretically, this research contributes to the literature by providing empirical validation of the DT-CSR relationship within the specific context of an emerging market, Morocco, where few such studies have been conducted. It confirms that the theories (stakeholder, legitimacy) explaining this link in developed economies are also applicable to the Moroccan context.

Managerially, the primary takeaway for Moroccan leaders is that investments in digital transformation and CSR performance should not be viewed as two distinct cost centers, but as synergistic investments. The adoption of advanced digital tools can be a direct lever for achieving sustainability goals. For investors, a firm's level of digital maturity (measured, for example, through analysis of its reports) could serve as a leading indicator of its future extra-financial performance.

Despite the methodological rigor and robustness of the empirical model, the study presents several limitations that invite further investigation. The sample size, limited to 47 companies, restricts generalization. Moreover, the cross-sectional design captures association rather than causality, and the reliance on textual indicators may not fully reflect actual technological integration.

Moving forward, longitudinal (panel) studies are necessary to confirm causality. It would also

be pertinent to decompose the ESG scores to examine whether digitalization differentially impacts the Environmental, Social, or Governance pillars. Finally, the use of alternative proxies for digitalization (IT budgets, adoption of specific technologies) could complement the results obtained.

Ultimately, this study establishes that engagement in digital transformation is a fundamental driver of extra-financial performance. For Moroccan companies, the integration of digital tools no longer represents merely an imperative for economic competitiveness, but also a key pathway toward establishing their legitimacy and societal responsibility in an increasingly transparent world.

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