



**ENVIRONMENTAL, SOCIAL AND GOVERNANCE
DISCLOSURES AND FIRM VALUE OF FIRMS LISTED AT THE
NAIROBI SECURITIES EXCHANGE, KENYA: A DYNAMIC
GENERALIZED METHOD OF MOMENTS APPROACH**

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Abstract

The relationship between environmental, social, and governance performance (ESG) and firm value remains a controversial topic in corporate sustainability research. This study examines the effect of the individual ESG dimensions on firm value for 54 firms listed at the Nairobi Securities Exchange, Kenya, which published annual reports between 2017 and 2023. Using a document review process and the MSCI materiality Index, the performance of the individual dimensions of ESG was determined. The study applied a dynamic Generalized Method of Moments (GMM) model to establish the relationship. The results indicate that (a) Governance performance had a positive and significant relationship with firm value (p -value = 0.004), (b) The first lag of social performance had a negative and significant relationship with firm value (p -value of 0.046) while (c) environmental performance had no significant effect on firm value. Accordingly, managers

should focus on governance and time social initiatives carefully. Policymakers should rethink ESG rules with unclear value impacts and investors should focus on companies that have proper governance structures in place.

Keywords: Firm value, Environmental disclosure, Social disclosure, Governance disclosure, Generalized Method of Moments, Endogeneity, Nairobi Securities Exchange

INTRODUCTION

Background

The risks, performance and ultimately the value of an organization are inextricably linked to its interaction with its owners and workers, the community around it, the economy and the natural environment (IFRS Foundation, 2023). Pu (2022) documents that by December 2020, funds that were sustainability themed were valued at USD 37.9 trillion. He attributes this in part to the negative screening criteria in which firms with weaker ESG performance are excluded from investors' portfolios. Pulino (2022) attributes enhanced ESG awareness to rising activism towards it. Whatever the reason for it, regulators, Non-Governmental Organizations and industry associations have risen to the occasion and come up with legislation, standards and guidelines to manage the transitions to ESG based reporting. Thus, as at December 2021, 71 out of 121 stock exchanges which are members of Sustainable stock exchange initiatives had issued ESG reporting guidelines to the companies traded in their exchanges (Sustainable Stock Exchange Initiative, 2021). On 26 June 2023, the International Sustainability Standards Board (ISSB), an arm of the IFRS foundation, issued the first two standards IFRS S1 and IFRS S2 which take effect from 1 January 2024 for reports published in 2025 (IFRS Foundation, 2023). In Kenya, the Institute of Certified Public Accounting (ICPAK) has set 1 January 2027 as the mandatory adoption date for all Public Interest Entities. SMEs will have to adopt the standards by 1 January 2029 (ICPAK, 2023).

Empirically, the jury is still out on whether sustainability improves firm value. Chang and Yoo (2023), Jose et al. (2014) and Yoon et al. (2018) found a positive relationship between sustainability and firm value. The results in Ersoy et al. (2022), Giannopoulos et al. (2022), Lee and Rhee (2023), Pulino et al. (2022), Simsek and Cankaya (2021), Xie et al. (2018) were mixed. Buallay et al. (2020), Chong and Loh (2023), Crisóstomo et al. (2011) found a negative relationship while Attia et al. (2023) and Pu (2022) even found a non-linear relationship! Even meta-analysis yield different results. Atz et al (2022) and Hornuf and Yüksel (2022) find that ESG is not financially beneficial while Whelan et al. (2021) found that there were more papers

reporting positive relationships between ESG and value than those reporting negative or neutral relationships.

Pu (2022) argues that the controversy may be due to the methodologies used by the researchers. He attributes it to either wrong modeling or the use of mixed datasets and the problem of endogeneity. Buallay et al. (2020), Ferrero-Ferrero et al. (2016) etc. have discussed the presence of omitted variables in the relationship between sustainability variables and performance indicating the possibility of correlation between the dependent variable and the error term. Hang et al. (2018), Chams et al. (2021) have found evidence of reverse causality between sustainability variables and firm value. Hermalin (2008) argues that value explains corporate governance and not the other way, giving evidence of reverse causality. All this is indicative of endogeneity. Such problems go against the strict exogeneity requirements of the Gauss-Markov theorem indicating that results out of a model based on Ordinary Least Square (OLS) could be biased and inconsistent.

According to Hackel (2011) firm value is the present value of the free cash flows generated by a firm's assets discounted at its cost of capital. De Luca (2019) states that firm value is the difference between the discounted cash-inflows derived from the investment and its cost of capital, reiterating the principle stated by Marshall in 1890 that a company creates value if and only if, the return on capital invested exceeds its cost of capital. Frykman & Tolleryd (2010) contend that creation of firm value is only scientific to an extent while the rest is created in a myriad of everyday decisions within the organization. One way in which a company endears itself to stakeholders and hence create intangible value is how it interacts with its stakeholders, and how it treats the natural environment.

According to Solikhah and Maulina (2021) environmental disclosure is a form of corporate responsibility that requires businesses to prepare and publish sustainability reports either separately or in their annual reports showing information on the environment that stakeholders consider useful for decision making. Akhter et al. (2022) state that the disclosures could be financial or nonfinancial, numeric or non-numeric, could have information that is either favorable or unfavorable to indicate how environmentally friendly or harmful the company is. They states that such disclosures, even when they show negative performance, are indicative of the management's consciousness of the issue and therefore could have a positive impact on stakeholders.

Social disclosure is the practice of publicizing the social implications of an organization's economic actions to specific interest groups or to the general public in order to obtain and retain a license to operate in society (Noronha, 2014). According to (S&P Global, 2017) a social license to operate reflects the public's ongoing acceptance of an entity's economic activities.

The idea entails going over and above the conventional role of accounting for the capital invested by the shareholders in a business. These extensions are based on the idea that a company has a duty to do more than just maximize profits for its owners (Belal, 2008). Additionally, Aluchna and Idowu (2017) state that companies publish social information to improve their competitive advantage, as a source of innovation or even with expectations of cost savings.

Corporate governance disclosure is the communication of governance information by management to people outside the firm (Farvaque et al., 2012). Shin (2014) states that corporate governance is a mechanism that balances the relationship between rights and responsibilities of owners and managers through institutional arrangements. The IFC (2010) states that good corporate governance is evidence of good leadership and ability to contribute better to the country and the society. Companies with high standards of governance are perceived as investor friendly with better accountability and smooth decision making processes and they are typically able to access cheaper capital from equity and debt holders. Several high profile corporate failures have been documented by, McLean and Elkind (2004) on Enron, Lowenstein (2002) on Long Term Capital Partners, Sorkin (2009) on Lehman Brothers and AIG and so on. Garratt (2006), Gillespie and Zweig (2010) attribute these failures to failure in corporate governance.

Research Problem

Recent trends in firm value at the Nairobi Securities Exchange have been at best, erratic. The benchmark NSE 20 index has seen a consistent decrease having peaked at 4,069 points on 21 August 2017 and going down to its lowest point was 1420 points on 06 November 2023 (African financials, 2024). Market capitalization has fluctuated from a high of 2.6 trillion shillings in January 2018 down to 2.2 trillion in February 2020, up to 2.8 trillion in August 2021 and down to 1.4 trillion shillings in December 2023, (CEIC Data, 2023). Within this period, a hypothetical shareholder who held a portfolio based on the NSE 20 index could have lost up to 65% of firm value whereas one who had held a portfolio based on the market has lost up to 44% of their investment. In 2021 the exchange launched the ESG Guidance manual, Nairobi Securities Exchange (2021) in which they opine that good Environmental, Social and Governance (ESG) practices are positively correlated with higher returns and better financial performance of firms. The problem, however, is that empirical studies undertaken elsewhere in the world on the subject are inconclusive.

Pu (2022) argues that the controversy may be attributable to either wrong modeling, the use of mixed datasets, and the problem of endogeneity. Buallay et al. (2020), Ferrero-Ferrero et

al. (2016) etc. highlight endogeneity risks in sustainability-performance studies, where unobserved factors may create spurious correlations through omitted variable bias, violating the exogeneity assumption. Hang et al. (2018) and Chams et al. (2021) have found evidence of reverse causality between sustainability variables and firm value. This study investigates the ESG disclosure-valuation relationship using a methodology that is robust to endogeneity for companies listed at the NSE, Kenya.

Objectives of the Study

To evaluate the effect of sustainability disclosures on firm value of firms listed at the Nairobi Securities Exchange, Kenya.

The specific objectives of the study were:

- i. To establish the effect of environmental disclosures on firm value of firms listed at the Nairobi Securities Exchange.
- ii. To establish the effect of social disclosures on firm value of firms listed at the Nairobi Securities Exchange.
- iii. To establish the effect of governance disclosures on firm value of firms listed at the Nairobi Securities Exchange.

Research Hypotheses

To achieve the aforementioned objectives, the following null hypotheses were formulated and tested:

H₀₁: Environmental disclosures have no significant effect on firm value of firms listed at the Nairobi Securities Exchange.

H₀₂: Social disclosures have no significant effect on firm value of firms listed at the Nairobi Securities Exchange.

H₀₃: Governance disclosures have no significant effect on firm value of firms listed in at Nairobi Securities Exchange.

Value of the study

The results of this investigation will advance theory, practice and policy. Based on the results, management will be better able to design corporate ESG policy in order to maintain or increase their valuation. Policy making bodies such as the CMA, NSE, and CBK will be able to determine mandatory sustainability disclosure levels. Such institutions, being political in nature tend to focus more on the stakeholder theory view of companies and there is real danger that they could lose focus on the profit motives of investors. Finally, in academia, researchers and

scholars can utilize the findings to inform and inspire future academic inquiries. The findings of this study contribute to the expanding body of knowledge aimed at clarifying and potentially resolving the prevailing controversy.

REVIEW OF LITERATURE

Theoretical Review

This study is premised on several theories including; Shareholder Value Theory: This was first put forth by Friedman (1970). It argues that, the one and only social responsibility of business involves utilizing its resources and undertaking actions aimed at maximizing value. On this basis, managers should focus on profitability and shareholder returns, viewing environmental efforts as costs unless they enhance financial performance. Criticisms of this school of thought comes from among others Bower and Paine (2017), who referred to shareholder centrality as a fundamental mistake in the running co companies because it is erroneous in its presumptions, legally unclear, and harmful in reality.

Stakeholder Theory was initially proposed by Freeman (1984), argues that an entity's goals should be determined by weighing the requirements of the many stakeholders such as employees, community and the environment. On this basis, environmental performance is valued as it strengthens stakeholder relationships, ensuring long-term viability. Critics such as Marcoux (2003) claim that such a business strategy would undermine the fiduciary duties managers owe to shareholders and expand managerial obligations to multiple stakeholders, which can foster moral hazard, create perverse incentives, and ultimately undermine stakeholder confidence in governance systems.

Empirical Review

Ersoy *et al.* (2022) used data from Refinitiv to determine how the relationship between market value of US commercial banks and ESG ratings working with straight line and quadratic OLS models for the years 2016 to 2020. They found; (1) no statistically significant relationship between the overall ESG rating, the environmental rating, the governance rating and the social rating vis-à-vis the firm value based on the linear models and (2) an inverted-U shaped relationship between the overall sustainability rating, social rating on one hand and the valuation of the banks by the market. For the environmental score, the results showed a U-shaped relationship with market value based on the non-linear models. Chen *et al.* (2025) based their study on a census of all food industries listed in Taiwan. Their data was collected from Taiwan Economic Journal and covered the period

from 2015 to 2020. They observed that the social dimension of ESG exhibited a significant inverse relationship with both ROA as well as ROE.

Yu and Xiao (2022) carried out a study to investigate how firm value varies with variations in ESG performance. They used 804 Chinese A-share exchange traded companies which published quantitative ESG data between 2010 and 2019. They find positive relationships between firm value and each of the Environmental rating, the Social rating, the Governance rating and the overall ESG rating. Aydogmus *et al.* (2022) take 1720 firms with a market cap above USD 2.85 billion whose data is available in the Refinitive database for the period 2013 to 2021 ending up with 14043 firm-year observations. They find no significant correlation for the environmental rating vis-à-vis firm value measured using Tobin's Q.

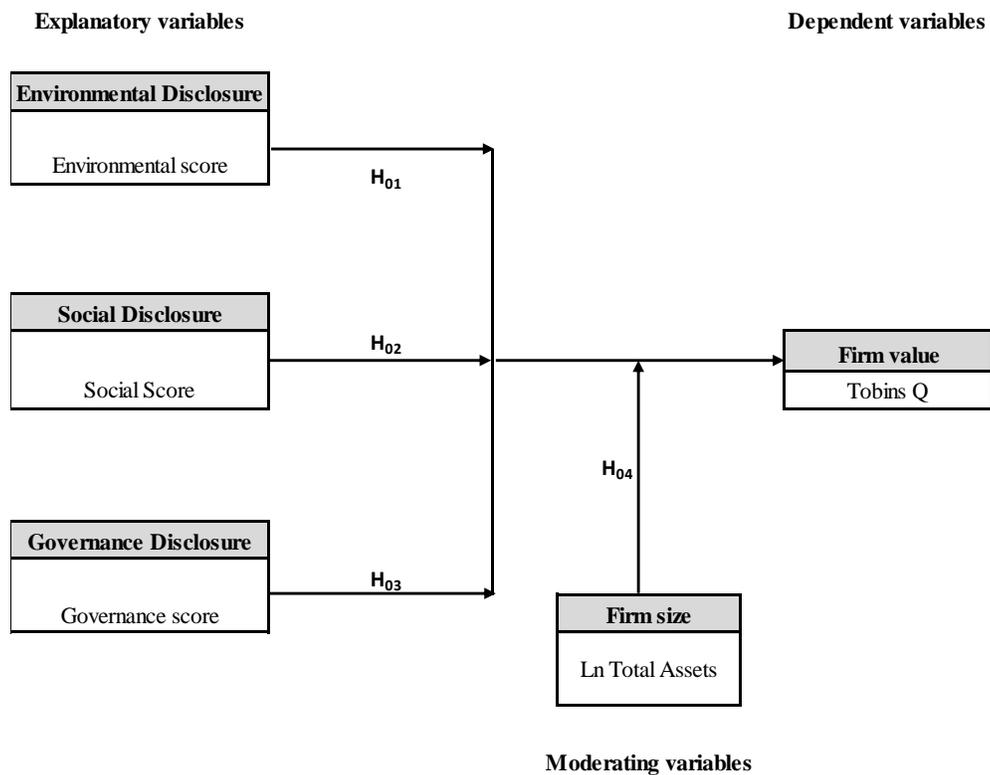
Fiskerstrand *et al.* (2019) investigated the effect of ESG disclosure on accounting performance of firms with equities trading at the Euronext's Oslo Brs in Norway. For the market return, they used OSEBX, the Oslo Brs index and a Norwegian Government 10 year bonds as the risk free rate. They subjected these to both Carhart (1997) 4 factor model using market risk premiums of Norway from Ødegaard (2017), size and book to market ratios and momentum ratios. They then performed the Fama-MacBeth (1973) procedures. They find no evidence that a portfolio built on High minus Low (HML) on the ESG factor would have generated a significant return difference once they adjusted for the market risk. They also find no evidence that a Clean minus Dirty (CMD) factor carries a risk premium in the Norway.

Ahmad *et al.* (2021) used 351 firms included in the FTSE350 index for the years 2002–2018 to estimate the effect of the combined and disaggregated ESG ratings on market value using both dynamic panel data techniques and static panel data models. On the separate ESG dimensions, only the social rating had any significant relationship with the market value. In Jordan, Mansour *et al.* (2022) studied the relationship between financial performance and adherence to corporate governance. They took data from 84 companies' annual reports whose shares were actively traded at the Jordanian bourse over the years 2009 to 2016. Using both a GMM model and a fixed effects model they tried to establish the correlation. For both models the corporate governance was found to be significantly correlated with the company's market share.

Conceptual Framework

A conceptual framework visually illustrates how the key variables in a study relate and interact.

Figure 1 Study conceptual framework



RESEARCH METHODOLOGY

Research Philosophy and Research Design

This study adopted the positivist philosophy. Positivism was judged ideal for this research since the data used for the study is generated by processes that are independent of the researcher's manipulation (Matthews & Ross, 2010). The study adopted an explanatory research design. According to Punch (2006) an explanatory research design attempts to make sense of data that is already existing. It aims to answer the questions of why or how things or circumstances are what they are. A researcher using exploratory design does not have control over the data they will use (Robson & McCartan, 2016).

Model Development

Using OLS, the estimator for β in a simplified matrix model; $Y = \beta_1 X + u$ is given by the elements of the leading diagonal of the results of $(X'X)^{-1} (X'Y)$ where Y is a matrix of $T \times 1$ elements of the dependent variables, β is a matrix of $T \times N$ dimensions of the predictor variables X is a matrix of $T \times N$ independent variables, u is a $T \times 1$ vector of errors and T and N are the time periods and number of entities respectively. The GMM estimator uses, in addition to the explanatory variables, a set of instrumental variables. Instrumental variables may or may not

include some or all of the explanatory variables and their lagged version, and lagged versions of the dependent variables. The classic studies of Arellano and Bond (1990) Arellano and Bover (1995) and Blundell and Bond (1998) used lags of explanatory variables as instruments. For GMM, the model looks like;

$$Y = \beta_0 + \beta_1 X + \beta_2 Z + u_{it}$$

Where, Z is made up of L x T array of instruments.

From the foregoing, and in comparison to the matrix estimator for OLS, the GMM matrix estimator for β becomes $(X'ZWZ'X)^{-1}(X'ZWZ'Y)$

Where, W is an L x L symmetric, positive semidefinite matrix weighting matrix (Wooldridge, 2010).

Thus the simplified general model of the study (in matrix form) is given by;

$$Y = \beta_0 + \beta_1 X + \beta_2 Z + u \quad \dots\dots\dots 1$$

Where, Y is a vector of T x 1 elements of the dependent variable, X is a matrix of T x N elements of the independent variables, Z is a matrix of T x L elements of instrumental variables and, β_0 is a vector of T x 1 elements of the intercept.

To make the model dynamic, a lagged version of the outcome variable is added to the RHS to give;

$$Y = \beta_0 + \beta_1 Y_{(t-1)} + \beta_1 X + \beta_2 Z + u \quad \dots\dots\dots 2$$

Where, $Y_{(t-1)}$ is a matrix (T-1) x 1 elements of the lagged dependent variables

Once parameterized and expanded, the simplest model becomes;

$$Fvalue_{it} = \beta_0 + \beta_1 Fvalue_{i(t-1)} + \beta_2 Socscore_{it} + \beta_3 Envscore_{it} + \beta_4 Govscore_{it} + \beta_5 Z + \epsilon_{it} \quad \dots\dots\dots 3$$

Where, for the i^{th} company in period t; $Fvalue_{it}$ is, the firm value, $Socscore_{it}$ is, the social score, $Envscore_{it}$ is, the environmental score, $Govscore_{it}$ is, the governance score, $Size_{it}$ is, its size based on the total assets, ϵ_{it} is, the error term, and, $Fvalue_{i(t-1)}$ is, in period t-1, the firm value. An analysis of the matrix Z is provided in section 3.7.

Target Population and Sample Selection

The study's target population was 54 out of the 62 companies with shares trading at the exchange. The difference of 8 companies was made up of 4 companies that were suspended (Capital Markets Authority, 2024), and 4 that have not published annual reports during the period in scope. The study adopted a census approach and thus included all the 54 firms whose shares were being actively traded at the Nairobi Securities Exchange and had published annual accounts from 2017 to 2023.

Several considerations informed the selection of 2017 as the base year: first, Del Gesso and Lodhi (2024) found a spike in ESG literature beginning in 2018; second, this was just after CMA issued its Code of Corporate Governance (CMA, 2015); and third, for methodological reasons, as a dynamic panel data study requires a short timespan (T) and a large number of entities (N). Additionally, an increasing number of firms had institutionalized sustainability reporting into shareholder reports, creating structured datasets for analysis.

Data Collection

Data was extracted from shareholder reports, and where necessary, company websites. Financial and the sustainability data was extracted for the period from 2017 to 2023. Balance sheets, income statements was taken from shareholder reports. Closing stock prices for each company was extracted from africanfinancials.com. Sustainability information was extracted from among other places, the sustainability report, (whether included in the shareholder reports or separate), the corporate governance report, chairman's statement and in some cases, even from the financial statements. The researcher finally had 7 cross sections each with 54 entities. Using the MSCI materiality map, the sustainability disclosure ratings were computed for each company.

Arellano-Bond Serial Correlation Tests

A prerequisite for first difference or system GMM is model disturbance terms that are not serially correlated. That way, the first difference and the second difference of the model disturbance terms have a correlation of 0.5 i.e. $\text{Corr}(\Delta u_{it}, \Delta u_{i,t-1}) = -0.5$ with no higher-order serial correlation. This is important because it forms the basis of using lags of the dependent, predetermined and strictly exogenous independent variables. The test by Arellano and Bond (1991) has the following null hypothesis:

$$H_0 : \text{Corr}(\Delta u_{it}, \Delta u_{i,t-j}) = 0, j > 0$$

Accordingly, for a model with no serial correlation beyond $j = 1$, the hypothesis is rejected for the first lag and is not rejected for all other lags afterwards. Simply put, AR1 should have a p-value below 0.05 while AR2 should have a p-value higher than 0.05. Fortunately, the Stata's Roodman (2009) command xtabond2 comes with this command built in so it is not necessary to run separate tests after the regression is results.

Sargan Hansen Test for Over-identifying Restrictions

These are tests due to Sargan (1958) and Hansen (1982). Instrument variable methods require that the covariance of the error term and the instruments is zero ($\text{cov}(z,u) = 0$) while the

covariance of the instruments and the predictors should be non-zero ($\text{Cov}(x,z) \neq 0$) for the instruments to be valid. If an instrumental variable model complies with these two requirements, then it is said that the parameter β_1 is identified. Where there are more instruments (or moment conditions) than are needed for a consistent estimation, the model is said to be over-identified. In a situation where the total instruments is exactly equal to the estimation parameters, the system is said to be just identified.

In over-identified models, $L > K$, the validity of $L - K$ over-identifying restrictions can be tested, still assuming that at least K instruments are valid (L is the moment conditions while K is the parameters to be estimated). After one-step estimation, the null hypothesis is that the Sargan test statistic is asymptotically χ^2 distributed and having $L - K$ degrees of freedom. If the null hypothesis is rejected, that means that one or several instruments are invalid. It is however not possible to tell which one specifically. All that can be done is to sequentially remove the instrumental variables to determine which one is causing the problem. This is the basis of the sequential model selection. Again, the Stata command `xtabond2` comes with both these tests built in.

Model Selection

The tests above are important in determining the model to be used for hypothesis testing. To determine which lags to use, Kiviet (2019) proposes a systematic process for model selection. However, the first step requires that a maintained statistical model (MSM) is chosen by trial and error. This was process was automated by use of a simple Stata .do file to test and output results for all possible combinations of lags so that only the best was selected. According to Ozcicek and McMillin (1999), estimating a model with the wrong lag lengths gives results that are inconsistent and that selecting a higher order lag length than the true lag length causes an increase in the mean-square forecast errors while lower lag length often generates auto-correlated errors. To overcome this, the study employed a simple program written in Mata language to run Stata's Roodman (2009) `xtabond2` and return the diagnostic data only for the valid combinations.

Once the MSM was identified, the Kiviet (2019) process produced the model shown below;

Main Equation;

$$\begin{aligned} \log\text{value}_{i,t} = & \beta_1 \log\text{value}_{i,t-1} + \beta_2 \log\text{value}_{i,t-2} + \beta_3 \log\text{envscore}_{i,t} + \beta_4 \log\text{envscore}_{i,t-1} + \beta_6 \\ & \log\text{socscore}_{i,t} + \beta_7 \log\text{socscore}_{i,t-1} + \beta_9 \log\text{govscore}_{i,t} + \beta_{10} \log\text{govscore}_{i,t-1} + \gamma_1 \text{yr2019t} + \gamma_2 \\ & \text{yr2020t} + \gamma_3 \text{yr2021t} + \gamma_4 \text{yr2023t} + \alpha_i + \epsilon_{i,t} \end{aligned}$$

..... 4

The above equation is then coupled with the following gmmstyle and ivstyle instruments as described in Kiviet (2019);

gmmstyle instruments;

$$z1 = \begin{bmatrix} \logfvalue_{i,t-2} & \logfvalue_{i,t-3} & \logfvalue_{i,t-4} \\ \logenvscore_{i,t-2} & \logenvscore_{i,t-3} & \logenvscore_{i,t-4} \\ \logsocscore_{i,t-2} & \logsocscore_{i,t-3} & \logsocscore_{i,t-4} \\ \loggovscore_{i,t-2} & \loggovscore_{i,t-3} & \loggovscore_{i,t-4} \end{bmatrix} \dots\dots\dots 5$$

gmmstyle(1 1) instruments

$$z2 = [\logenvscore_{i,t-1} \ \logsocscore_{i,t-1}] \dots\dots\dots 6$$

gmmstyle(0 0) instruments

$$z3 = [\logenvscore_{i,t-1}] \dots\dots\dots 7$$

And ivstyle() instruments as;

z4 =

$$[yr2017 \ yr2018 \ yr2019 \ yr2020 \ yr2021 \ yr2022 \ yr2023 \ const] \dots\dots\dots 8$$

The combined matrix Z for the GMM estimation is given by;

$$z = [z1 \ z2 \ z3 \ z4] \dots\dots\dots 9$$

So that if Y is a matrix of i*t fvalue , X is a matrix of i*t logfvalue_{i,t-j}, logenvscore_{i,t}, logsocscore_{i,t} and loggovscore_{i,t} and Z is the above matrix of instruments, then the GMM estimator for β is;

$$\beta = (X'ZWZ'X)^{-1}(X'ZWZ'Y) \dots\dots\dots 10$$

RESULTS AND DISCUSSION

Descriptive Statistics

Table 1 Descriptive Statistics

Statistic	Firm Value	Environmental score	Social score	Governance score	Combined score
Mean	1.348	28.52%	37.69%	60.94%	44.01%
Median	00.954	13.33%	36.21%	63.44%	44.20%
Standard deviation	01.705	33.68%	27.25%	14.76%	18.89%
Minimum	00.189	00.00%	00.00%	12.25%	08.89%
Maximum	16.389	100.00%	100.00%	88.36%	85.61%
Observations	377.00	377.00	377.00	377.00	377.00

The firm value mean may be interpreted to indicate that investors at the exchange, on average valued at 1.348 times their assets. However the standard deviation of 1.704 shows that there is a very high variability between Tobin's Q in the companies suggesting that the median of 0.953 may actually give a better feel of the central tendency for this particular statistic. Environmental scores averaged 28.44% indicating a relatively low performance as measured by the index while the standard deviation of 33.67% suggests substantial variability in the scores, with many firms both significantly above and below the mean as read from the minimum of 0.00% and maximum of 100.00%. The social score has a mean of 0.38, indicating that firms, on average, perform moderately on social aspects. A standard deviation of 0.27 suggests low to moderate variability, with firms displaying a moderate range of social performance levels. Governance score has a mean of 0.6, which implies that on average, firms listed at the NSE have mildly robust governance practices. The standard deviation of 0.15 suggests relatively low variability, meaning most firms have governance scores close to the mean.

Post Estimation Diagnostic Tests

Table 2 Post estimation diagnostic test results

Test	z / χ^2	df	Pr > z / Pr > χ^2
Arellano-Bond test for AR(1) in first differences	-2.25		0.024
Arellano-Bond test for AR(2) in first differences	-0.75		0.452
Sargan test of overid. Restrictions	8.35	14	0.870
Hansen test of overid. Restrictions	8.44	14	0.865
GMM instruments for levels			
Hansen test excluding group	6.43	7	0.491
Difference (null H = exogenous)	2.02	7	0.959
gmm(logwinenvscore logwinsocscore, collapse lag(1 1))			
Hansen test excluding group	6.64	10	0.759
Difference (null H = exogenous)	1.80	4	0.772
gmm(logwinenvscore, collapse lag(0 0))			
Hansen test excluding group	7.82	12	0.7.99
Difference (null H = exogenous)	0.62	2	0.733
iv(yr2017 yr2018 yr2019 yr2020 yr2021 yr2022 yr2023)			
Hansen test excluding group	5.50	10	0.855
Difference (null H = exogenous)	2.94	4	0.568

The AR(1) has a z statistic of -2.25 with a p-value of 0.024 indicating the presence of first-order autocorrelation. This result is expected in dynamic panel data models since first-differenced error, Δu_{it-1} is mathematically related to $\Delta y_{i,t}$ the lagged dependent variable difference. The AR(2) has a z statistic of -0.75 with a p-value of 0.452, indicating no evidence of second-order autocorrelation. This outcome supports the validity of the instruments used in the model, as higher-order autocorrelation would violate the assumptions underlying the GMM estimator. The Hansen test also assesses the validity of the instruments used in the estimation. The test had a χ^2 statistic of 8.44 with 14 degrees of freedom. The p-value for this statistic is 0.865 indicates that there is no evidence against the validity of the instruments.

The Hansen test excluding the instruments used for the levels equation yields a χ^2 statistic of 6.43 with 7 degrees of freedom, with a p-value of 0.491 suggesting that the full set of instruments, even when this subset is excluded would be valid. The incremental Hansen test statistic (inclusive of the levels instruments) is 2.02 with 7 degrees of freedom, and a p-value of 0.959. This indicates that the excluded subset of instruments for levels is not correlated with the error term and can be considered exogenous and thus, these instruments contribute valid moment conditions to the model.

The predetermined instruments are included in the `gmm(1 1)` bracket, in this case, as `gmm(logenvscore logsocscore, collapse lag(1 1))`. The test, when this subset is excluded, is a χ^2 statistic of 6.64 with 10 degrees of freedom, and a p-value of 0.759. Again, this high p-value indicates that the remaining instruments continue to be valid. When the instruments are included, the difference-in-Hansen test statistic is 1.80 with 4 degrees of freedom, and a p-value of 0.772 which suggests that there is no evidence of endogeneity in the subset, once again, affirming that the lagged values of logenvscore and logsocscore (collapsed to reduce instrument count) are appropriate and valid instruments. Tests to determine whether the contemporaneous value of logenvscore and logsocscore could be treated as strictly exogenous determined that only logenvscore could be treated as strictly exogenous. This was evidenced by a Hansen statistic for the `gmm(0 0)` of 7.82 with 12 degrees of freedom, and a p-value of 0.799. While the high p-value implies that the model would still be valid without this instrument the incremental Hansen test statistic showed a statistic of 0.62 with 2 degrees of freedom, yielding a p-value of 0.733 which confirms that using the current values of logenvscore as `gmm(0 0)` instruments does not introduce endogeneity, and these instruments are valid for use in the model.

Inferential Statistics

Table 3 GMM Regression Results (Dependent variable: Firm Value)

Logfvalue	Robust					
	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Logfvalue L1.	0.5894	0.2330	2.530	0.014	0.1221	1.0568
Logfvalue L2.	0.3816	0.1534	2.490	0.016	0.0739	0.6893
Logenvscore L0.	0.0277	0.0465	0.600	0.554	-0.0655	0.1209
Logenvscore L1.	-0.0268	0.0430	-0.620	0.535	-0.1131	0.0595
Logsocscore L0.	0.0025	0.0744	0.030	0.973	-0.1467	0.1517
Logsocscore L1.	-0.0915	0.0448	-2.040	0.046	-0.1814	-0.0016
Loggovscore L0.	1.0305	0.3446	2.990	0.004	0.3393	1.7217
Loggovscore L1.	-0.3704	0.2933	-1.260	0.212	-0.9587	0.2178
yr2019	0.0148	0.0821	0.180	0.858	-0.1499	0.1795
yr2020	0.0232	0.1012	0.230	0.819	-0.1797	0.2262
yr2021	-0.0376	0.0427	-0.880	0.382	-0.1232	0.0480
yr2023	0.1167	0.0589	1.980	0.053	-0.0013	0.2348
_cons	0.1406	0.1312	1.070	0.289	-0.1225	0.4037

The F statistic value was 5.07 with a p-value of 0.0000 indicating that, jointly, the environmental, social and governance disclosures and the lagged values of firm value had a significant effect on firm value. Notably, both the first and second lag of firm value (p-value=0.014 and 0.016 respectively) are statistically significant. For environmental performance, the regression results showed a p-value of 0.554 and 0.535 for the contemporaneous and first lag performance. Consequently, the null hypothesis was not rejected for both the current and first lag of the environmental score.

Further, it was found that the current value of social disclosure had a coefficient of 0.0025 with a p-value of 0.973. The first lag of this variable though had a coefficient of -0.0915 with a p-value of 0.046. The null hypothesis was therefore not rejected for the contemporaneous value of social score but was rejected for the first lag. Notably however, this effect is negative. With regard to Governance scores, the first period had a coefficient of 1.0305 with a p-value of 0.004 while the second lag had a coefficient of -0.3704 with a p-value of 0.212. The null hypothesis is therefore rejected for the contemporaneous value but is not rejected for the first lag of governance score.

Key findings

The study found that governance scores drive firm value. The quality of governance as measured by MSCI materiality has a significant and positive effect on firm value. This is consistent with the resource dependence theory, of Pfeffer and Salancik (1978) which emphasizes the strategic importance of board composition in securing critical resources and external legitimacy and the findings of Nguyen and Nguyen (2020), who found that board independence, and dispersed ownership structures positively influenced firm value. A global meta-analysis by Dao and Nguyen (2020) confirmed the overarching positive link between effective corporate governance practices and enhanced firm value.

Additionally, the findings indicate that social performance as measured by the MSCI indicators has a significant and negative effect on firm value. These result compliment Vogel (2005) who states that the market for virtue is limited by the substantial costs of socially responsible business behaviour and the empirical results of Chong and Lo (2023) in which social performance is negatively correlated to firm value in the palm oil sector. Finally, firm environmental performance as measured by the MSCI indicators has no significant effect on firm value. This aligns with Public Choice Theory as advocated by Buchanan and Tullock (1962) and empirical results of Ahmad et al. (2021) who found no significant relationship between environmental performance and performance in FTSE 350 firms in the UK.

CONCLUSION AND RECOMMENDATIONS

The significant positive influence of past firm value underscores the importance of historical performance in shaping current valuations aligning with the dynamic capabilities theory. Governance disclosures showed a significant positive effect on firm value, emphasizing the critical role of strong governance in fostering investor confidence and long-term stability. Conversely, the first lag of social score exhibited a significant negative effect, suggesting that investors at the bourse may perceived investments in social initiatives as inefficiencies and downgrade their valuation of the companies. This result serves as a cautionary note for firms to carefully evaluate and implement social strategies to avoid unintended financial drawbacks.

The findings yield targeted recommendations across three domains. For practice, firms should prioritize governance while carefully evaluating social initiatives which may detract value if misaligned. For policy, regulators should adopt phased, cost-effective ESG disclosure rules, focusing on material metrics (e.g., quantifiable environmental data, diversity statistics) and supporting smaller firms with scalable frameworks. For theory, stakeholder theory requires

refinement to reflect that not all ESG dimensions equally affect value—contextual factors (market structure, geography) must be integrated to explain why governance drives value while social performance may not.

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APPENDIX

Abbreviations

CBK	Central Bank of Kenya
CMA	Capital Markets Authority
ESG	Environmental Social Governance
GMM	Generalized Method of Moments
NSE	Nairobi Securities Exchange
OLS	Ordinary Least Squares
ROA	Return on Assets