

Earning management practices and the disclosure of sustainability reporting in Jordanian family business: how COVID-19 plays a part?

Esraa Esam Alharasis

Department of Accounting, Mutah University, Karak, Jordan

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Abstract

Purpose – This study explores the moderating role of the COVID-19 crisis on the association between ESG scores and “Earnings Management (EM)” practices.

Design/methodology/approach – The developed hypotheses were tested using ordinary least squares (OLS) regression based on data from 50 Jordanian family businesses in the finance industry between 2010 and 2024. Furthermore, this investigation assessed the analytic results by employing a variety of robustness tests, such as the generalised method of moments (GMM) regression.

Findings – Multivariate regression shows that Jordanian family firms with stronger EM procedures have higher ESG sustainability scores during crisis period. For COVID-19’s moderating effects on each ESG component, “environmental and social” disclosure maximizes company capitalization and ESG disclosure as a whole boosts market value. However, governance factors unrelated to stakeholder interests play no significant role.

Practical implications – This study impacts enterprises, administrations and stakeholders. The moderating COVID-19 component increased the beneficial connection between EM practices and ESG scores. Thus, the findings encourage legislators and regulators to pass sustainable practice monitoring and company transparency and engagement laws. After COVID-19, businesses must rebuild the economy and accelerate and hold themselves accountable for adopting environmentally friendly decisions into their planning and governance control. The findings may help regulatory bodies and policymakers boost ESG reporting credibility by providing assurance from an impartial third party with strong duties. Developing ESG reporting dependability and comparability requires institutional support and professional pressure. Jordan may increase punishments for prohibited ESG building and combine federal direction with voluntary industry efforts to maximise economies of scale and reduce transformation costs.

Originality/value – This study examines whether EM procedures improve ESG sustainability scores and whether the COVID-19 pandemic caused this. This is novel when examined in a family business. Developmental Jordanian data makes this study important. Growing global economic trends and fundamental societal differences between wealthy and developing countries require more CSR/ESG research. ESG sustainability disclosure has been studied less than how the COVID-19 pandemic affected a company’s finances and non-financials. EM procedures directly affect ESG sustainability disclosure in Jordanian family firms, but COVID-19 moderates this link.

Keywords Earnings management, Sustainability, ESG score, COVID-19, Family business, Jordan

Paper type Research article

1. Introduction

COVID-19 may impact “Earning Management (EM)” and “Environmental, Social, and Governance (ESG)” reporting in Jordan’s financial industry-family-owned enterprises. The “Sustainability Standards Board (SSB)” and “International Accounting Standards Board (IASB)” produce financially relevant sustainability standards (IAS Plus, 2020). Standardisation matters more post-COVID-19 (Chen *et al.*, 2023). Sustainability reporting and standardised non-financial standards with rules are driven by investor demand for sustainability rankings and transparency. Global sustainability disclosure guidelines for public



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sector investors are being created by the “International Sustainability Standards Board (ISSB)”. Following COVID-19, investors worldwide assessed companies using ESG parameters (Salehi *et al.*, 2025). Thus, this study examines how the COVID-19 pandemic moderates the link between ESG scores (both total and component scores) and EM practices.

Despite COVID-19, resilient enterprises can grow (Gao and Geng, 2024). Many scholars recommend correcting the company’s systemic flaws. Crisis study demonstrates corporate governance matters. Corporate governance governs an organisation’s financial management through rules, programmes and practices. The board of directors, shareholders and other stakeholders promote integrity, accountability and openness in company operations and decision-making. Effective financial management and corporate governance enhance confidence, reduce risks and create long-term stakeholder value (Almarayeh *et al.*, 2025). Environmentalism, social responsibility and corporate governance increase a company’s worth and reputation (Savio *et al.*, 2023). The global “Sustainable Investment Alliance (GSIA)” anticipated ESG assets would reach \$22.9 trillion in 2016, 26% of total assets under management and \$35.3 trillion in pandemic 2020, 54.56% growth. Gao and Geng (2024) forecast a 9.4% ESG investing market growth between 2023 and 2032, reaching USD 17.2 trillion in 2022 and USD 46.5 trillion in 2032. In market volatility, ESG protects investors (Al Amosh and Khatib, 2023). Economic and political uncertainty boosts sustainability disclosure scores. ESG affects company success; however, scholars differ on its definition (Savio *et al.*, 2023). ESG increases stakeholder trust, financing limits, risk and reputation. Some academics term it “agency cost”. Overinvesting in responsibility, abandoning investment initiatives with positive net present values and prioritising personal benefit over short-term goals might diminish the firm’s worth (Sultana *et al.*, 2022). Corporate performance and stakeholder morale can increase. COVID-19 worsened managers’ EM and agent–principal conflict. Managers prioritise ESG disclosure for shareholder trust (Huang and Ge, 2024).

According to “Stakeholder and Agency Theories-Type II” in family enterprises, majority shareholders may manipulate revenues to profit themselves at the expense of “minority shareholders”. Managers falsify financial figures to deceive investors or change contracts (Saleh *et al.*, 2025; Alshdaifat, 2024a; Sharif, 2025). The COVID-19 problem causes managerial fraud and unprecedented EM. In COVID-19, sustainability information lowers financial instability’s impact on firm value (Savio *et al.*, 2023). ESG pillar mapping can boost performance in unpredictable times. ESG compliance in business benefits beyond morality (Farooq and Noor, 2023). Companies must prioritise ESG criteria and help users improve financial institution investment competence to invest in fair growth and climate protection (Tumewang *et al.*, 2025). Family enterprises may too.

ESG research is conflicting, focusses on developed countries, and does not apply to underdeveloped nations. Most ESG research focusses on corporate performance (Ab Aziz *et al.*, 2025a, b). ESG disclosures have been studied on crisis resilience (Al Amosh and Khatib, 2023; Savio *et al.*, 2023) and environmental management practices (Chouaibi and Zouari, 2022), but their impact on sustainability has not. Most crucially, family businesses have not been examined. Ranjbari *et al.* (2021) claim COVID-19’s early sustainability effects are unknown. Further research is needed. Kumar *et al.* (2024) and Del Gesso and Lodhi (2025) suggest more research to fill research gaps and close the knowledge gap. First, EM’s impact on ESG rankings is unclear. Second, industry-specific research is scarce. Third, ESG disclosure research has focussed on crisis management rather than COVID-19’s impact on scores and pillars (Al Amosh and Khatib, 2023). Fourth, family firms and “small and medium-sized enterprises (SMEs)” have not been studied for CSR/ESG disclosure. Kumar *et al.* (2024) suggest studying family-controlled enterprises’ CSR/ESG disclosure. Consequently, this study examined the sole effect of EM and COVID-19 on ESG disclosure and COVID-19’s moderating effect. This analysis considered previous shortcomings, making use of 2020 Jordanian family business data. Due to shifting global economic trends and social-cultural differences between developed and developing nations, scholars recommend more research on sustainable development strategies in underdeveloped countries (Muttakin and Subramaniam,

2015). Emerging economies need more sustainability reports; hence, more research has been done on the topic.

This study provides new empirical data on how businesses adopted governance norms in their daily operations before and after the crisis. This study examines regulatory procedures using several approaches to understand corporate governance amid economic crises. This study analyses how ESG affects extreme firms' crisis response and reinforces COVID-19. A short time window was used to examine the relationship between the COVID-19 pandemic and ESG sustainability disclosure as well as the impact of EM practices on ESG scores before and after the crisis. This was done since Jordan's institutional context is unique and COVID-19 triggered the pandemic. The field of crisis management in Jordan is new, and this research represents its foundation. This paper advances the field. First, this study theoretically evaluates the sole effect of EM practices on ESG scores and COVID-19's expected moderating role. It uses "agency, signalling, legitimacy, and stakeholders' theories" and Jordanian family enterprises' particular institutional context. Second, this analysis explains how EM affects ESG sub-items to better understand their functions. Third, Kumar *et al.* (2024) suggest assessing COVID-19's impact on ESG performance individually and jointly. This study examines ESG disclosure before and after COVID-19. The literature currently includes additional research on the economic impact of CG supervision levels. Fourth, unlike most research, this paper investigates the situation in developing nations. This study examines EM, COVID-19, and ESG disclosure to fill this gap. No study has studied EM's impact on ESG ratings in developing nation family enterprises before or after COVID-19.

Ordinary least squares (OLS) regression was used to analyse data from 50 Jordanian family financing businesses from 2010 to 2024. Multivariate analysis shows that Jordanian family enterprises with stronger EM practices have higher ESG sustainability scores during the crisis. Each ESG component is moderated by Covid-19, but "environmental and social" disclosure optimises business capitalisation and ESG disclosure boosts market value. However, governance issues unrelated to stakeholder interests have little impact. Policymakers, regulators and investors can use the study to ensure non-financial performance during crises. The efficacy of emerging countries' ESGs during volatility is also examined. Sustainable and socially responsible corporate policy must be flexible. Country company ESG compliance improves social balance and catastrophe readiness. During COVID-19, stakeholders may monitor corporations' environmental and social behaviour to build pressure.

Structure of the article: Context is covered in Section 2. The theory foundation and hypotheses are in Sections 3 and 4. The research approach and methodology are in Section 5. Sections 6 and 7 covers empirical analysis, robustness checks and findings. Section 8 concludes with study limitations, implications and future avenues.

2. Context background

2.1 Sustainability in emerging economies: finance industry–family business in Jordan

Jordanian SMEs are 90% family-owned (The Jordan Times, 2014). Jordan's "family-owned SMEs (FSMEs)" must survive to expand. In above-average Jordan, FSMEs drive the economy. Family businesses dominated Jordan's 1976–1980 economic development strategy. Family businesses may be able to offer local alternatives to abroad goods and services with this suggestion (Alharasis, 2025b). Other groups promoted family and economic progress. All multinational firms rely on family businesses for growth and creativity. Their global financial impact is well-known (Alharasis, 2025c). National economic dynamics affect FSMEs (Alharasis and Mustafa, 2024). These numbers show FSMEs' economic and growth value. Financial transactions improve Jordan's economy. Jordan's financial industry uses ESG practices to improve their reputation, comply with national and international laws and satisfy stakeholders, demonstrating their commitment to sustainability and responsible business. "Central Bank of Jordan (CBJ)" promotes ESG in Jordanian institutions (Alharasis, 2025d).

A 2023 “Green Finance Strategy” promotes sustainable finance and reduces finance industry climate risks (CBJ, 2023). In 2020, Jordan’s financial sector survived COVID-19. This industry is stable thanks to government and CB policies that increased capital, liquidity and profitability (Cooper, 2017). Financial firms are socially monitored. Due to their relevance, ecological effect and positive and negative externalities, CG and ESG research targets such enterprises (Kumar *et al.*, 2024). Finance may promote or damage an economy. This sector requires ethical, responsible institutions (Ben Fatma and Chouaibi, 2021). Limited research advises studying CG-ESG interactions in specific industries. Small and family businesses are ignored. This paper analyses Jordan’s expanding enterprises.

3. Theory and hypotheses

ESG shape and CG-firm ESG engagement have been studied using “agency, stakeholder, legitimacy, resource-based, neo-institutional, institutional legitimacy, upper-echelons, critical mass, signalling, and stewardship theories” (Del Gesso and Lodhi, 2025). EM, ESG and COVID-19’s projected moderating effect are examined using “agency, stakeholder, legitimacy, and signalling theories”. “Agency theory” supporters explained the expected “information asymmetry” problem owing to uncertainty during the coronavirus pandemic. Businesses experienced “workplace closures, social isolation, border controls, and lockdowns” from COVID-19. Investors, debtors, local communities, the financial industry, the state and workers suffered from economic uncertainty. The “stakeholders’ theory” asserts that all parties need trustworthy disclosures to obtain stakeholder trust and legitimacy to foresee the pandemic’s financial consequences and make suitable actions (Shen *et al.*, 2020). After decades of requests to broaden, non-financial discourses are expanding. User feedback suggests annual corporate reports omit non-financial events and social responsibility (Kumar *et al.*, 2024).

Given the agent’s authority, “agency theory” asserts that the agent, motivated by self-interest, maximises his personal benefit, often at the principals’ economic detriment (Deegan, 2019). “Information asymmetry” induced by “owner-manager conflicts” in “agency theory” is linked to “signalling theory”. Family firms have conflict of interest when dominant shareholders know more than minority shareholders. Family firms’ “majority and minority shareholders” clash due to the “agency problem type II” between family and non-family owners. “Agency conflict” produces illegal EM and “information asymmetry”. Just recent ESG sustainability disclosures can re-establish stakeholder trust and support (Alshdaifat *et al.*, 2024a). The coronavirus crisis “information asymmetry” problem was predicted by “agency theory” due to ambiguity, uncertain assessments and manager exploitation. Incomplete information causes conflict of interest, especially during epidemics. Daily operators and family management knows the firm well. Conflict of interest increases with biased manager knowledge (Davidson *et al.*, 2004).

Mistrust and uncertainty originate from information bias. Peace and investor confidence require ESG disclosure to meet social responsibility criteria (Huang and Ge, 2024). Higher-return investments grow businesses. Management information helps shareholders make good decisions. ESG reporting guidelines may indicate “asymmetric information”. “Stakeholder theory” highlights stakeholders, while “agency theory” describes manager–shareholder competition. The “signaling theory” describes the crisis’s arbitrary accounting statistics evaluations, whereas the “stakeholder theory” analyses financial openness. Investors may trust the company’s trustworthiness and capital market growth after non-financial disclosure. Like “signaling theory”, “agency theory” explains shareholder persuasion with asymmetric information (Leventis and Caramanis, 2005). Per shareholder norm, this user wants higher earnings quality and lower EM to legitimise an organisation’s financial reporting. Company financial reputation improves with positive social responsibility signals about governance, social issues and the environment (Lah *et al.*, 2025). Possible organisational improvement. According to “stakeholder theory”, stakeholders need corporate disclosures to allocate

resources. “Stakeholder theory” holds managers accountable to more stakeholders and views the firm as part of society than “agency theory” (Alshdaifat *et al.*, 2024b). Managers should provide high-quality financial data to stakeholders to allocate resources. The latter lacks “information asymmetry”; hence, “agency and stakeholder theories” are valid. In the unstable economic climate caused by COVID-19, people demand actual and equitable disclosures, not symbolic and incorrect ones, so firms can succeed by meeting society’s expectations (Sultana *et al.*, 2022).

Act legally by following societal norms, attitudes, ideas and definitions. CSR and ESG enterprises seek shareholder, trade union, politician and government support for legitimacy. The report suggests ESG disclosure ratios improve ESG behaviour. This lobbying tries to promote market legitimacy and transparency by making management more socially accountable (Shahab and Ye, 2018). Many research theories highlight non-financial disclosures. These frameworks highlight ESG transparency to help stakeholders evaluate a company’s ethics and sustainability. Socially responsible enterprises attract customers, shareholders and workers. Sustainability reports and other communication channels can greatly influence stakeholder behaviour (Dyllick and Hockerts, 2002). Braam *et al.* (2016) say these papers legitimise and promote a company. The study includes “stakeholder theory and legitimacy theory” to address stakeholders’ specific information needs in addition to “legitimacy theory’s” focus on general society interests. Potential creditors, investors, and suppliers are stakeholders. Because underperforming companies may utilise ESG disclosure to exploit “legitimacy theory” and misrepresent their sustainability efforts without evidence (Alzuod *et al.*, 2025). By reducing legitimacy risks, these corporations ignore environmental measures. The “stakeholder theory” holds firms accountable to shareholders and others (Freeman, 1984). Socially responsible companies have stronger support from consumers, shareholders and staff. The research uses “legitimacy theory” to investigate EM practices and ESG reporting. Greater ESG disclosures test management’s stakeholder legitimacy. Managers’ symbolic activities demonstrate social responsibility to employees and stakeholders. Significant actions can change management, organisation and societal norms (Ntim and Soobaroyen, 2013).

Crisis literature examines perspectives. Dias *et al.* (2016) prioritised stakeholder expectations during the 2008–2009 financial crisis. American corporations become more socially concerned after the financial crisis. Crisis-hit enterprises increase social responsibility to reduce risk (Chintrakarn *et al.*, 2021). After a disaster, social responsibility boosts firm value and reputation. Environmental and social governance may draw stakeholders to crisis-hit enterprises. Company survival suffers from pandemic. High-ESG companies may be less affected by the pandemic since managers may improve EM during chaos. Company finances encourage ESG (Sharma *et al.*, 2020). Popkova *et al.* (2021) showed that some firms used social responsibility to attract stakeholders during COVID-19. Social responsibility during crises protects company value. Sponsoring voluntary activities increases stakeholder support (Qiu *et al.*, 2021). EM “maximizing share prices, meeting shareholder expectations, and avoiding debt covenant violations” and “maximizing their remuneration” help management and the enterprise. Makhaiel and Sherer (2017) also include debt contract breach or default, market perspective of firm value and benchmarks including avoiding losses or profit reductions and meeting business analyst expectations as EM causes. Accounting literature highlights regulatory compliance and profit lowering to reduce political cost hazards as EM incentives.

ESG could improve emerging nations, which require more help than industrialised nations (Engelhardt *et al.*, 2021). Mandatory and optional pandemic rules may improve ESG. In developing nations, mandatory ESG policies reduce financial risk during the pandemic and consumers and investors may choose ESG-involved companies, which may boost performance. Companies can reduce COVID-19 and market fluctuations by sustainability. Governments and stakeholders want ESG from businesses. To manage and recover from the COVID-19 epidemic, businesses must maintain stakeholder relationships and demonstrate

moral accountability. Investment in performance throughout time. Businesses can discover stakeholder needs amid emergencies. Companies can protect stakeholders and avoid noncompliance by responding to pandemics. ESG improves company reputation, stakeholder trust, budgetary constraints and risk. Some scholars call it “agency cost” (Alshdaifat *et al.*, 2024a). Excessive initiative investment, removing assets with positive net present values and prioritising individual gain over short-term interests can reduce corporate value. Business efficiency and stakeholder satisfaction can improve. Manager EM and agent–principal conflict intensified with COVID-19. ESG rankings build investor trust in managers.

Most publicly listed companies in developing countries like Jordan are family owned (Alharasis, 2025a). Weak internal controls and corporate governance make family controlled firms more likely to abuse power and deceive non-family owners. Family managers publish high ESG scores to gain shareholder trust. According to Jordanian custom, agency conflict-type II between “minority and majority shareholders” encourages family owners to make more non-financial disclosures to improve their business success and social status. Due to their mission, family owned businesses have long-term sustainability plans. This study tests COVID-19’s moderating effect on EM practices and ESG score in Jordanian family businesses for the first time and suggests the subsequent hypotheses (see Figure 1):

- H1. EM practices and ESG disclosures are positively correlated during the COVID-19 pandemic.
- H2. EM practices and environmental disclosures are positively correlated during the COVID-19 pandemic.
- H3. EM practices and social disclosures are positively correlated during the COVID-19 pandemic.
- H4. EM practices and governance disclosures are positively correlated during the COVID-19 pandemic.

4. Method and data

4.1 Selected data

The statistics originate from ASE’s 2010–2024 “sustainability reports” for Jordanian family firms (see Figure A1 of Appendix A). Starting in 2010 to reduce GFC’s impact. Table 1 lists the original 185 Jordanian family firms. 50 family firms remain upon excluding 90 firms with missing data and 45 non-finance firms.

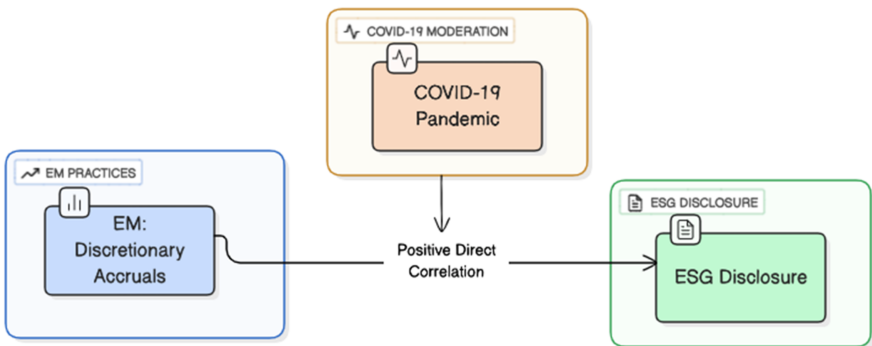


Figure 1. Theoretical framework. Source: Created by author

Table 1. Sampling

Item	Total	Observations
Total family business	185	2,775
(-) firms with missing data	(90)	(1,350)
(-) firms from non-finance industry	(45)	(675)
<i>Total accepted sample</i>	<i>50</i>	<i>750</i>

Source(s): Created by author

4.2 Earnings management measurement

EM studies have used “discretionary accruals, smoothness, timeliness, loss avoidance and investor responsiveness” as proxies (Dechow *et al.*, 2010). The model developed by Jones (1991) and modified by Dechow *et al.* (2010) determines EM using “discretionary accruals (DA)”. First, “total accruals (TA)” were calculated using this equation:

$$TA = (\Delta CA_{it} - \Delta Cash_{it}) - (\Delta CL_{it} - \Delta STD_{it} - \Delta TP_{it}) - Dep_{it} \quad (1)$$

Where: “ ΔCA_{it} = change in current assets; $\Delta Cash_{it}$ = change in cash; ΔCL_{it} = change in current liabilities; ΔSTD_{it} = change in shore-term debt; ΔTP_{it} = change in taxes payable and Dep_{it} = Depreciation and amortization”.

Then, the “discretionary accruals (DA)” variable has been calculated as follows:

$$DA_{it} = [TA_{it} / A_{it} - 1] - [\alpha 1 (1 / A_{it} - 1) + \alpha 2 (\Delta REV_{it} / A_{it} - 1 - \Delta REC_{it} / A_{it}) + \alpha 3 (PPE_{it} / A_{it} - 1)] \quad (2)$$

Where: “ DA_{it} = Discretionary accruals for the firm *i* in period *t*; ΔREC_{it} = Change in accounts receivable (debtors) for the firm *i* in given year *t*; TA_{it} = Total accruals for the firm *i* in year *t*; ΔREV_{it} = Change in revenue for the firm *i* in year *t* scaled by total assets; PPE_{it} = Gross property, plant and equipment for the firm *i* in year *t* scaled by assets and A_{it-1} = Lagged value of total assets at the beginning of the year”.

This study measures accrual EM using the modified Jones model by Dechow *et al.* (2010) and discretionary accruals. Each “industry-year” group with six observations undergoes a cross-sectional OLS regression. This method estimates DA better than others because it controls for economic conditions that affect TA across “industry-year” groups and allows coefficients to vary over time. The following equation estimates “industry-year” groups with six or more observations’ normal accruals.

4.3 Design of research

This study examines how COVID-19 will affect EM practices and ESG score proportions. Multiple regression is used to study ESG sustainability disclosure’s value effect. Thus, a “Ordinary Least Squares (OLS)” regression model with “time-varying fixed effects and a robust firm-clustering model” is used. Modified linear models are used in this study (see Table A2 of Appendix 2 for variables definition and measurement):

$$SUS = \delta 0 + \delta 1 DA + CONTROLS + FE + \epsilon. \quad (3)$$

$$SUS = \delta 0 + \delta 1 Period + CONTROLS + FE + \epsilon. \quad (4)$$

$$SUS = \delta 0 + \delta 1 DA + \delta 2 Period + \delta 3 DA * Period + CONTROLS + FE + \epsilon. \quad (5)$$

$$SUS_ENV = \delta_0 + \delta_1DA + \delta_2Period + \delta_3DA * Period + CONTROLS + FE + \epsilon. \quad (6)$$

$$SUS_SOC = \delta_0 + \delta_1DA + \delta_2Period + \delta_3DA * Period + CONTROLS + FE + \epsilon. \quad (7)$$

$$SUS_GOV = \delta_0 + \delta_1DA + \delta_2Period + \delta_3DA * Period + CONTROLS + FE + \epsilon. \quad (8)$$

5. Results

5.1 Statistics on description and correlation

Table 2 shows descriptive statistics. Regarding the dependent variables, the sample’s average ESG score variable SUS is 10%, with min and max values from 0 to 70%. ESG variables SUS_ENV, SUS_SOC and SUS_GOV reporting have mean values of 6, 3 and 1%. Values range from 0 to 35, 28 and 15%. The average score of the EM practices variable DA is 0.7%, with a standard deviation of 0.4% and a range of 0%–60%. The moderating impact of COVID-19 (period) average value of 0.25% means 25% of the data is from the COVID-19 period and 75% from the pre-COVID-19 period.

Table 3 shows “Spearman correlation matrix” figures. Outcomes show no collinearity. Additionally, each model’s mean variance inflation factor (VIF) is under 3.

5.2 Regression findings and discussion

Table 4 shows COVID-19’s moderating role in EM practices and ESG disclosure OLS regression results. Model P-values with 0.01 explanatory power are 75%. Model 1 shows that EM practises increase ESG sustainability disclosure scores, especially during COVID-19, at 0.01 (Coeff. = 0.00, *t* = 2.12). After COVID-19, EM practices tend to have a greater impact on ESG performance. Strong governance of the climate serves to improve the ethics, accountability and risk-sharing of the COVID-19 project. The term “harmonisation” is more important than it has ever been (Lah et al., 2025). This is because in the wake of the COVID-19 epidemic, ESG reporting has expanded. Organisations that are dominated by families and have weak internal controls and corporate governance schemas are more susceptible to abuse authority and deceive others who are not members of the family. This is because of “agency conflict-type II”. ESG has become more appealing to investors as a

Table 2. Descriptive statistics

Variable	Mean	Median	Std. dev.	Min	Max
SUS	9.662	0.000	17.138	0.000	69.979
SUS_ENV	5.516	0.000	9.727	0.000	34.989
SUS_SOC	2.737	0.000	5.787	0.000	27.992
SUS_GOV	1.402	0.000	2.638	0.000	15.252
DA	0.007	0.001	0.040	0.000	0.594
Period	0.250	0.000	0.434	0.000	1.000
SIZE	21.110	21.261	0.862	18.423	22.293
DEBIT	4.445	4.458	0.120	2.857	4.553
OPN	0.979	1.000	0.154	0.000	1.000
TEN	0.510	1.000	0.503	0.000	1.000
BIG-4	0.967	1.000	0.187	0.000	1.000
BLOCK_OWN	0.662	0.732	0.208	0.174	0.994
FOR_OWN	0.362	0.267	0.292	0.000	0.906
N	750				

Source(s): Created by author

Table 3. Correlation matrix

Variables	1	2	3	4	5	6	7	8	9	10
<i>SUS</i>	1.000									
<i>DA</i>	-0.364***	1.000								
<i>Period</i>	0.428***	-0.273***	1.000							
<i>SIZE</i>	0.354***	-0.394***	0.299***	1.000						
<i>DEBIT</i>	0.311***	-0.066	0.057	0.614***	1.000					
<i>OPN</i>	-0.025	-0.063	-0.030	0.260***	0.143*	1.000				
<i>TEN</i>	-0.201**	0.086	-0.460***	0.018	-0.015	0.002	1.000			
<i>BIG-4</i>	0.094	-0.188**	0.110	0.053	0.031	0.111	-0.018	1.000		
<i>BLOCK_OWN</i>	-0.199**	-0.126*	0.095	-0.121	-0.451***	0.042	0.102	-0.022	1.000	
<i>FOR_OWN</i>	-0.130*	-0.165**	0.109	-0.053	-0.068	0.088	0.132*	0.030	0.549***	1.000

Note(s): This table presents Spearman correlation matrix results amongst the dependent and independent variables. All continuous variables are winsorized at the 1 and 99% levels each year to reduce the influence of potential outliers. **, * Correlation is significant at the 0.01 and 0.05 level (2-tailed), respectively

Source(s): Created by author

Table 4. Regression results

DV =	Model (1) Coeff. Moderating Period (SUS)	Model (2) Coeff. SUS_ENV	Model (3) Coeff. SUS_SOC	Model (4) Coeff. SUS_ GOV<
<i>Intercept</i>	75.212 (2.43)**	31.159 (1.80)*	33.020 (2.64)**	11.126 (3.16)***
<i>DA</i>	0.000 (2.120)*	0.000 (1.370)	0.000 (3.08)***	0.000 (2.020)*
<i>Period</i>	517.587 (6.16)***	246.942 (4.38)***	227.462 (5.10)***	42.246 (1.620)
<i>DA* Period</i>	0.000 (4.28)***	0.000 (2.62)**	0.000 (4.55)***	0.000 (0.720)
<i>SIZE</i>	-4.008 (-2.57)**	-1.669 (-1.920)	-1.803 (-2.80)**	-0.542 (-3.28)***
<i>DEBIT</i>	2.897 (4.33)***	1.262 (3.35)***	1.338 (5.14)***	0.299 (5.22)**
<i>OPN</i>	-2.494 (-1.110)	0.087 (0.090)	-1.514 (-1.550)	-1.072 (-1.030)
<i>TEN</i>	4.618 (2.43)**	1.978 (1.890)	1.836 (2.51)**	0.808 (2.84)**
<i>BIG-4</i>	1.922 (0.850)	0.846 (0.840)	0.787 (0.850)	0.289 (0.650)
<i>BLOCK_OWN</i>	6.690 (1.590)	1.935 (0.750)	4.204 (2.16)**	0.577 (0.820)
<i>FOR_OWN</i>	-10.408 (-3.65)***	-5.710 (-2.85)*	-3.473 (-3.67)***	-1.236 (-2.80)**
<i>Firm clustering and Year FE</i>	<i>Controlled</i>	<i>Controlled</i>	<i>Controlled</i>	<i>Controlled</i>
<i>N</i>	750	750	750	750
<i>F-statistic</i>	(15)***	(15)***	(15)***	(15)***
<i>R²</i>	75%	72%	67%	66%
<i>Mean VIF</i>	2.26	2.26	2.26	2.26

Note(s): “***, **, * Indicate statistical significance at the 0.01, 0.05, and 0.10 percent levels, respectively, using a two-tailed test. This table presents the OLS regressions of EM on SUS and the moderating Period on this over the period (2010–2024) controlled by year and firm clustering”

Source(s): Created by author

result of the heightened agency conflict risk caused by COVID-19. It is therefore necessary for EM practices to enhance, monitor and regulate corporate management in order to fulfil the expectations of pandemic shareholders and stakeholders. In times of crisis, firms make preparations for IFRS-ESG disclosure in order to avoid the pressure from stakeholders. As a result of corporations minimising confrontation with stakeholders whose requirements are growing throughout the epidemic, ESG collective performance scores are increasing.

The findings may provide support for the administration’s long-term strategies by enhancing the perceptions of stakeholders during times of crisis. This would enable stakeholders to display their beneficial intents and moral attitudes towards society during times of health crises, while also allowing them to build a strong connection with the administration once the crisis has passed (Alharasis and Mustafa, 2024). In the context of the health crisis, ESG performance contributes to a reduction in the uncertainty that exists (Alshdaifat et al., 2024a). One way to improve the company’s reputation is to meet the needs of stakeholders and to speed up the recovery process from the epidemic (Alzuod et al., 2025). Increasing non-financial disclosures such as ESG ratings that are based on

Jordanian customary practices and “agency conflict-type II” between “minority and majority shareholders” is one way that family owners attempt to improve their business success and social status (Alshdaifat *et al.*, 2024b). The patterns of sustainability literature are supported by this study, which substantiates the findings of earlier research on the implementation of environmentally responsible business practices in family owned companies. As per the findings of the research conducted by Alharasis (2025d), mission-driven family owned firms are equipped with long-term strategy plans that place an emphasis on sustainability. COVID-19 has been shown to increase the connection between environmental management practices and ESG disclosures made by family businesses, which lends support to hypothesis H1.

The pandemic crisis positively impacts environmental and social performance at 0.01 (Coeff. = 0.00, $t = 2.62$; Coeff. = 0.00, $t = 4.55$, respectively) and failed to find any significant impact of moderating COVID-19 in regard to the governance factor (Coeff. = 0.00, $t = 0.720$), indicating that companies considered external stakeholders’ direct interests to show trust and ethical accountability. The theory of stakeholders asserts that management considers health crises to be internal organisational issues. Furthermore, the theory asserts that stakeholders’ pandemic interests emphasise social and environmental performance, which means that businesses will act in accordance with these interests. Based on the findings of other researchers (see Chintrakam *et al.*, 2021; Sharma *et al.*, 2020; Qiu *et al.*, 2021; Popkova *et al.*, 2021), the results are in agreement with their findings. Businesses operating in emerging markets placed a higher emphasis on environmental and social performance than they did on governance during the COVID-19 epidemic. This indicates that firms in developing nations give priority to the desires of stakeholders during times of health emergencies in order to effectively manage their relationships with stakeholders. The lack of pressure on companies to give additional governance disclosures and the fact that stakeholders have a good grasp of the pandemic are the reasons for the poor governance performance of companies during the COVID-19 pandemic. As opposed to hypothesis H4, which is rejected, hypotheses H2 and H3 are supported.

6. Sensitivity and additional tests

6.1 Alternative measure of SUS

A company’s sustainability report can reveal ESG engagement, according to research by Girella *et al.* (2022). To ensure primary analysis reliability, this study retests the hypotheses with the dummy variable *SUS_DUM*, which is an additional ESG measure. The analysis results presented in Table 5 are similar to the original analysis results.

6.2 Endogeneity – GMM model

A robustness assessment utilising the two-step “System Generalised Method of Moments (System GMM)” estimator addressed endogeneity concerns and improved analysis reliability. Table 6 indicates a statistically significant positive association over 1% for the lagged dependent variable (L.ESG), indicating a uniform ESG disclosure trend. Period and DA remain statistically significant and in expected directions, validating previous findings. The key findings are robust, indicating that endogeneity is unlikely to mislead calculated correlations.

7. Conclusions

7.1 Final remarks

Both the ways in which EM practices influence ESG scores and the ways in which COVID-19 moderates the Jordanian family company in finance as an emerging economy are investigated in the current article. According to the results of multivariate regression, Jordanian family businesses that have a greater number of EM practices have a higher score on ESG

Table 5. Regression results

DV =	Model (7) Coeff. <i>SUS_DUM</i>	Model (8) Coeff. Moderating Period (<i>SUS_DUM</i>)
<i>Intercept</i>	1.105 (2.39)**	0.984 (2.36)**
<i>DA</i>	0.000 (7.93)***	0.000 (2.17)**
<i>Period</i>		11.230 (5.69)***
<i>DA* Period</i>		0.000 (1.880)*
<i>Controls, Firm clustering&Year FE</i>	Yes	Yes
<i>N</i>	750	750
<i>F-statistic</i>	(15)***	(15)***
<i>R²</i>	76%	77%
<i>Mean VIF</i>	1.64	2.26

Note(s): “***, **, * Indicate statistical significance at the 0.01, 0.05, and 0.10 percent levels, respectively, using a two-tailed test.” This table presents the OLS regressions of EM on *SUS_DUM* and the moderating Period on this over the period (2005–2023) controlled by year and firm clustering” using the following equations

Equation(1/H1): $SUS_DUM = \delta 0 + \delta 1DA + \delta 2SIZE + \delta 3DEBIT + \delta 4OPN + \delta 5TEN + \delta 6BIG-4 + \delta 7BLOCK_OWN + \delta 8FOR_OWN + FE + \epsilon$

Equation(1/H1): $SUS_DUM = \delta 0 + \delta 1DA + \delta 2Period + \delta 3DA *Period + \delta 4SIZE + \delta 5DEBIT + \delta 6OPN + \delta 7TEN + \delta 8BIG-4 + \delta 9BLOCK_OWN + \delta 10FOR_OWN + FE + \epsilon$

Where: “*SUS_DUM* is the dummy variable of suitability measured following to prior research (Rao and Tilt, 2021) using a scoring system of 1 for disclosed items and 0 for items not disclosed”

Source(s): Created by author

sustainability. Therefore, businesses that have higher environmental management practices may leverage ESG factors to promote transparency and attract investors who are committed to ethical and sustainable practices. As a result of the moderating function that COVID-19 played, the association between environmental management practices and ESG sustainability disclosure was reinforced. This suggests that a high level of “agency conflict-type II” would lead to an increase in environmental management practices and encourage higher ESG disclosures in order to gain the confidence and authorisation of stakeholders. This is supported by the “Environmental and Social” elements of ESG sustainability reporting; nevertheless, governance is not tied to stakeholders. As a result of this, it has been established that family businesses have implemented measures to combat the COVID-19 pandemic by assuring ESG reporting and displaying ethical crisis behaviour. In order to increase earnings and sustainability, it is important to encourage and expand ESG initiatives.

7.2 Implications

This study combines “agency, signalling, legitimacy, and stakeholder theories” to show how could COVID-19 moderates the link between EM and ESG disclosures, offering new empirical insights. According to agency theory, the findings demonstrate how greater stakeholder scrutiny during crises can limit or divert EM actions, which are commonly perceived as managerial opportunism, towards increasing ESG transparency. Signalling theory suggests that during the pandemic, firms used ESG disclosures as a strategic communication technique to communicate social responsibility and financial viability. According to legitimacy theory, enhanced ESG reporting has helped corporations maintain their legitimacy in the face of rising public and regulatory expectations. Companies’ active

Table 6. GMM analysis

Variables	Eq. (3) SUS	Eq. (4) SUS	Eq. (5) SUS	Eq. (6) SUS_ENV	Eq. (7) SUS_SOC	Eq. (8) SUS_GOV
<i>L.SUS</i>	0.462 (0.071)***	0.403 (0.076)***	0.389 (0.068)***			
<i>L.SUS_ENV</i>				0.372 (0.089)***		
<i>L.SUS_SOC</i>					0.342 (0.093)***	
<i>L.SUS_GOV</i>						0.435 (0.079)***
<i>DA</i>	0.103 (0.062)*		0.148 (0.052)**	0.091 (0.069)**	0.067 (0.061)*	0.129 (0.053)**
<i>Period</i>		0.092 (0.045)**	0.041 (0.046)	0.083 (0.054)*	0.056 (0.049)	0.108 (0.042)**
<i>DA × Period</i>			0.131 (0.046)**	0.038 (0.069)*	0.069 (0.041)**	0.248 (0.089)
<i>Controls</i>	(−0.031)*	(−0.028)**	(−0.027)*	(−0.029)	(−0.025)**	(−0.026)**
<i>AR(1) χ^2</i> <i>(p-value)</i>	6.42 (0.011) ***	5.79 (0.016) ***	6.54 (0.010) ***	5.37 (0.021) ***	6.18 (0.013) ***	6.61 (0.009) ***
<i>AR(2) χ^2</i> <i>(p-value)</i>	1.18 (0.278)	1.51 (0.207)	1.23 (0.267)	1.39 (0.237)	1.48 (0.212)	1.35 (0.241)
<i>Hansen J-stat</i> <i>(p)</i>	13.08 (0.324)	13.92 (0.384)	12.77 (0.298)	14.26 (0.392)	13.61 (0.363)	12.89 (0.339)
<i>No. of</i> <i>Instruments</i>	36	35	39	38	38	38
<i>Observations</i>	750	750	750	750	750	750

Note(s): *Significant at the 0.10 level; **significant at the 0.05 level and ***significant at the 0.01 level
Source(s): Created by author

reaction to stakeholder demands, such as maintaining ESG activities during the epidemic, demonstrates a commitment to greater accountability beyond financial measurements and lends credence to stakeholder theory.

In practice, the study delivers valuable information regarding business ESG performance prior to and during the COVID-19 crisis to regulators, investors, shareholders, government agencies, communities, employees and consumers. ESG disclosures can be utilised by these stakeholders to demonstrate crisis management and good governance. The findings emphasise the need of including non-financial disclosure obligations in corporate governance frameworks, especially during periods of volatility, for regulators and policymakers. The study also advances understanding of ESG conduct in emerging markets, where stakeholder pressures vary widely and regulatory enforcement is usually inadequate. Long-term, flexible ESG policies can strengthen corporate resilience, societal cohesion and future disruption preparation. During times of crisis, stakeholders may increase their scrutiny of companies' social and environmental activities, emphasising the importance of accurate and consistent ESG reporting. Organisations that demonstrate genuine ESG involvement are more likely to earn the legitimacy and trust of stakeholders during uncertain times.

7.3 Limitations and future research suggestions

This research, much like other empirical studies, is limited in a variety of different ways. In the beginning, the article is solely focussed on institutions that are located in Jordan. It is necessary for prospective studies to investigate the ways in which EM practices influence other emerging

market economies. As a result of the quantitative nature of this study, it is possible that future research will require conducting “in-depth interviews and case studies” with “CEOs, directors, creditors, and other stakeholders” in order to gain an understanding of their sustainability practices. The association between environmental management practices and ESG ratings might be retested in a subsequent study utilising a larger data set to compare the pre- and post-ESG sustainability reporting requirements.

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Supplementary material

The supplementary material for this article can be found online.

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Corresponding author

Esraa Esam Alharasis can be contacted at: esraa_alharasis@mutah.edu.jo