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How Do Institutional Pressures Reshape the Association Between Corporate Sustainability Disclosure and Firm Value in Emerging Economies? The Moderating Role of the Audit Committee Function

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ABSTRACT

This study examines the influence of normative (e.g., voluntary sustainability reporting guidelines) and coercive (e.g., mandatory corporate governance [CG] requirements) pressures on the relationship between corporate sustainability disclosure (CSD) and financial performance (FP), focusing on the moderating role of audit committee characteristics. Using 1863 firm-year observations from 207 companies listed and unlisted on the Amman Stock Exchange (2014–2022), the study employs panel quantile regression and two-stage PQR to address endogeneity issues. Results show that CSD adoption increased after the 2018 sustainability guidelines, positively affecting FP. Audit committee size and independence strengthen the CSD–FP link, particularly after the 2017 CG reforms, indicating coercive pressures' role in enhancing governance. However, frequent audit committee meetings and technical expertise may weaken the CSD–FP relationship. The study emphasizes governance frameworks shaped by normative and coercive pressures as key to maximizing the financial benefits of sustainability disclosures for firms.

1 | Introduction

The evolution of corporate sustainability disclosure (CSD) has transitioned from traditional financial reporting to include environmental, social, and governance (ESG) factors, making CSD a vital tool for enhancing corporate value by improving reputation and fostering stronger stakeholder relationships (Fifka 2013; Fuhrmann et al. 2017; Sethi et al. 2017). Research has shown that CSD aligns corporate strategy with sustainability initiatives, positively influencing firm performance and attracting investor interest (Cohen et al. 2015; Cormier et al. 2016; Farooq and De Villiers 2019). In emerging markets such as Jordan, corporate governance (CG) reforms and sustainability reporting guidelines, particularly after 2017, have been instrumental in enhancing governance standards and enhancing investor confidence (Alhababsah 2022; JCGC 2017; Amman Stock Exchange 2022). However, despite these regulatory efforts, CSD adoption in Jordan remains low compared with developed markets due to the absence of mandatory CSD regulations, with companies gradually embracing voluntary sustainability practices (Gerged 2021; Orazalin and Mahmood 2020).

Although existing literature has largely focused on developed economies like the United States (Harjoto and Laskmana 2018), Australia, New Zealand (Farooq and De Villiers 2019), Korea (Lee and Jung 2016), and Italy (Menicucci and Paolucci 2023),

studies on the CSD–firm value relationship in emerging markets such as India, Malaysia, Sri Lanka, and Turkey remain underexplored (Al-Shaer and Zaman 2019; Bodhanwala and Bodhanwala 2018; Jan et al. 2019; Kalash 2021; Thoradeniya et al. 2015). In Jordan, the few available studies, such as those by Al-Smadi et al. (2020), offer limited insights and do not consider the impact of the sustainability reporting guidelines introduced in 2018. This gap in the literature underscores the need for theoretically grounded, empirical research to examine how voluntary CSD guidelines reshape the relationship between CSD and firm value in emerging economies. This study seeks to address this gap by exploring the following research question: *How do voluntary CSD guidelines reshape the link between CSD and firm value in emerging markets?* Understanding the influence of voluntary CSD frameworks is essential to comprehend how they affect CSD behavior and contribute to financial performance, particularly in regions without fully established regulatory mandates (Mahmood and Uddin 2021).

The mandatory CG reforms in Jordan, implemented in 2017, also emphasized the importance of establishing effective audit committees (AC) to protect shareholder interests and meet stakeholder expectations (JCGC 2017). The role of ACs in moderating the CSD–firm performance relationship is crucial due to their governance function in ensuring transparency and accountability (Kuzey et al. 2023). Characteristics such as AC size, independence, and expertise enhance the credibility of sustainability disclosures, aligning them with regulatory expectations and improving financial performance through stronger stakeholder trust (Buallay 2020). Despite the importance of ACs, empirical research on their moderating role in the CSD–firm value relationship is scarce. In this context, Kuzey et al. (2023) and Elmghaamez et al. (2024) reveal mixed findings on the effectiveness of ACs, highlighting the need for further investigation, particularly in emerging markets, such as Jordan, which has recently implemented CG reforms. This leads to a second research question: *Does AC function moderate the association between CSD and firm value in the context of mandatory CG reforms?*

To address these research gaps, this study aims to (i) examine the association between CSD and firm performance before and after the 2018 voluntary sustainability reporting guidelines and (ii) assess the moderating role of audit committee characteristics in the CSD–firm value relationship in light of the 2017 CG reforms. Drawing on institutional theory, the study explores the role of both normative pressures (driven by societal expectations) and coercive pressures (such as regulatory mandates) (DiMaggio and Powell 1983; Suchman 1995) in shaping CSD practices (Farooq and De Villiers 2019). Consistent with Deegan (2019) and Johed and Catasús (2015), this study underlines how both coercive and normative pressures, central to institutional theory, are key in understanding the dynamics of CSD and its financial implications.

The study employs a context-specific CSD index tailored to the Jordanian context, drawing from prior CSD studies and established frameworks such as the Global Reporting Initiative (GRI) and the Sustainable Development Goals (SDGs). The index incorporates 197 items, covering economic, environmental, and social disclosures (GRI, 2006; SDGs, 2017). To ensure relevance and accuracy, the index was further refined through a pilot study designed specifically for Jordan, allowing the inclusion of region-specific factors and the enhancement of methodological robustness. This multi-dimensional approach ensures the index is both comprehensive and adapted to the unique regulatory and socio-economic context of Jordan. The statistical analysis is conducted using panel quantile regression (PQR) to assess 1863 firm-year observations from 207 listed and unlisted companies on the Amman Stock Exchange between 2014 and 2022. To account for endogeneity concerns, a two-stage PQR model is applied, offering more robust insights than traditional least squares methods (Cobb-Clark et al. 2016). PQR captures the conditional median of dependent variables, providing resilience to outliers and offering a comprehensive understanding of the CSD–firm value relationship (Powell 2022).

The findings indicate a notable rise in CSD adoption after the 2018 guidelines, with a positive correlation to financial performance, showcasing normative isomorphism. This reflects how societal expectations push firms to adopt sustainable practices, which in turn enhance their legitimacy and financial standing (Deegan 2019; Farooq and De Villiers 2019). However, despite this progress, CSD levels in Jordan remain lower compared with both emerging and developed markets, highlighting the need for further growth in these disclosures.

The results also underscore that audit committee size significantly strengthens the relationship between CSD and firm value, especially after the 2017 CG reforms. This aligns with the role of coercive pressures, where regulatory mandates bolster the effectiveness of governance mechanisms like audit committees, thereby amplifying the impact of CSD on financial performance (Johed and Catasús 2015). Audit committee independence further enhances the credibility of CSD, leading to more robust financial outcomes. This suggests that independent audit committees are better equipped to oversee sustainability disclosures, improving investor trust and firm valuation. However, the analysis reveals that frequent audit committee meetings and technical expertise may sometimes weaken the positive influence of CSD on financial performance. This could indicate that an overemphasis on technical compliance or excessive meetings may detract from strategic oversight, reducing the intended benefits of CSD. This finding suggests that while audit committees are vital for ensuring robust governance, their effectiveness in enhancing financial outcomes depends on balancing their operational dynamics with the broader goals of sustainability and performance improvement.

This study makes several key contributions. Empirically, it provides much-needed insights into the CSD–firm value nexus in Jordan, focusing on the moderating role of the audit committee function pre-and-post regulatory changes and professional guidelines. Theoretically, it enriches institutional theory by illustrating how both normative (voluntary CSD guidelines) and coercive pressures (mandatory CG requirements) influence the role of AC function in improving the added value of CSD in emerging markets (Deegan 2019). Methodologically, the application of PQR and a two-stage PQR model offers a robust approach for examining complex relationships between CSD, audit committees, and firm value (Powell 2022). The study's findings hold important implications for policymakers, corporate managers, and investors, advocating for enhanced governance structures

and broader adoption of sustainability practices in emerging economies like Jordan.

The remainder of the paper proceeds as follows: First, we review prior empirical studies and theoretical frameworks. Then, we outline the research design, followed by a discussion of empirical findings and robustness checks. Finally, the paper concludes with the key findings, limitations, and recommendations for future research.

2 | Background, Theory, Empirical Literature Review, and Hypothesis Development

2.1 | Sustainability Reporting Guidelines and Corporate Governance Reforms in Jordan

Jordan, a small Arab nation situated in the region of the Middle East, is bordered by Saudi Arabia, Iraq, Palestine, Israel and Syria (Central Bank of Jordan 2022). The country aims to provide a secure environment for its listed companies on the Amman Stock Exchange (ASE) while safeguarding investors' interests. Jordan's economy includes both private and public sectors, which collaborate to promote market growth. The industrial sector is particularly vital to the nation's economic development (Central Bank of Jordan 2007).

In the wake of the Arab Spring, Jordan experienced a significant influx of foreign investments, especially from countries in the Middle East affected by the uprising. This influx underscored the importance of CG in boosting investor confidence in the Jordanian financial market (Gerged, Albitar, and Al-Haddad 2023). To address this, Jordan introduced its CG code in 2009. The code was intended to strengthen the national economy by improving capital regulation and corporate structures within public shareholding companies. It provides a governance framework for companies listed on the ASE, clarifying rights and responsibilities to meet objectives and protect shareholders' rights (JCGC 2017).

Jordan presents a particularly compelling case for examining the CSD–firm value relationship due to its unique institutional, economic, and regulatory landscape. As a small open economy in the MENA region, Jordan has long served as a hub for regional trade and investment, underpinned by its political stability, strategic geographic location, and skilled labor force. Although ranked among the top three MENA countries in attracting foreign direct investment (FDI) during the early 2010s (Mohamed and Sidiropoulos 2010), Jordan's investment environment has evolved in response to shifting regional dynamics, including the aftermath of the Arab Spring and subsequent refugee inflows. By 2022, ownership structures in the ASE revealed a hybrid economic model: 51.9% of publicly listed companies were state-owned, 33.7% held by Arab investors, and 14.4% by non-Arab foreign stakeholders (ASE, 2022). This mixed-ownership structure introduces varied institutional logics and investor expectations, offering a unique lens through which to examine CSD behavior. Furthermore, the country's heavy reliance on service-based sectors such as tourism, which generated revenues exceeding 4.1 billion dinars in 2022, marking a 117% increase from 2021, highlights the economic relevance of sustainability in sectors vulnerable to environmental and reputational risks. Jordan's regulatory trajectory also adds theoretical richness; the shift from voluntary to quasi-mandatory governance mechanisms, including the 2017 Corporate Governance Code and the 2018 ASE sustainability guidelines, reflects a gradual institutionalization of sustainability and governance norms. These features collectively make Jordan an exemplary context for investigating how normative and coercive institutional pressures influence the financial materiality of sustainability disclosures in emerging markets.

Crucially, in May 2017, the Jordan Securities Commission (JSC) updated the CG guidelines, replacing the previous 2009 voluntary rules. The new guidelines mandated that companies listed on the ASE adopt enhanced governance practices with a phased implementation, allowing time for companies to meet the new responsibilities (JCGC 2017). According to the 2017 CG code, Jordanian companies must include a CG report in their annual reports or in a separate document signed by the chairman of the board of directors (BOD). This report should detail the application of CG rules and company guidelines, including a list of current BOD members, specifying the number of BOD meetings held, the attendance of each member, and their classification as independent or non-independent and executive or non-executive. The CG code also indicates that the BOD should consist of 5–13 members, with the majority being non-executive and 1–3 members being independent. The report should also provide information on BOD membership, identify the chairman, and the names of the members of various committees, such as audit, governance, remuneration, nomination, and risks committees.

Regarding audit committees (ACs), the 2017 CG reforms state that CG reports should include AC details, including members' qualifications and experience in finance or accounting and their meetings with external auditors. Specifically, it requires that AC members possess experience in accounting or finance, with at least one member holding relevant certifications. The AC is likewise required to meet at least four times per year, including one meeting with the external auditor without management present (JCGC 2017).

In 2018, the ASE introduced sustainability reporting guidelines for listed companies, available in both Arabic and English. These guidelines emphasized the importance of sustainability reporting and outlined key sustainability measures and international standards, such as the GRI and the SDGs (ASE, 2020). In 2022, the ASE released updated sustainability reporting guidance, which aimed to enhance companies' understanding of the benefits of sustainability reporting, including improved reputation, brand loyalty, and the provision of a clear overview of the company's value to stakeholders. This guidance also stressed the importance of ESG disclosures, covering areas such as environmental impact, water usage, emissions, employment practices, human rights, and governance (ASE, 2022). Moreover, the ASE has improved investors' understanding of how sustainability reporting can influence financial performance, encouraging greater corporate engagement in sustainability disclosure and supporting firms and governments in achieving sustainability goals like green bonds. This initiative keeps investors informed about global trends and regulations related to financial and

nonfinancial corporate impacts (ASE, 2022). These newly enacted CG reforms and sustainability reporting guidelines have practically motivated our study to exclusively examine the possible moderating impact of the AC function on the link between CSD and FP pre- and post-2017 CG reforms and 2018 sustainability reporting guidelines.

2.2 | Theoretical Framework: Neo-Institutional Theory

Neo-institutional theory provides a comprehensive framework for understanding how external pressures influence CSD. It emphasizes that firms must align their practices with institutional norms to meet societal expectations, a process that helps them secure legitimacy and sustain long-term success (Castelló and Lozano 2011; DiMaggio and Powell 1983; Meyer and Rowan 1977). These pressures are categorized into three types: coercive, mimetic, and normative. Coercive isomorphism arises from external pressures such as legal mandates and regulations, typically imposed by governments or regulatory bodies, whereas normative isomorphism stems from societal and professional expectations, often driven by NGOs and industry organizations.

While other theoretical frameworks like stakeholder, legitimacy, and agency theories have been used to analyze corporate engagement in CSD, neo-institutional theory offers the most holistic explanation of how external forces shape these practices and their impact on financial performance (Brammer et al. 2012; Campbell 2007; Reverte 2009). By aligning with institutional expectations through CSD, firms not only enhance their legitimacy but also reduce information asymmetry and transaction costs, ultimately boosting firm value (Cormier and Magnan 2017; Li et al. 2020; North 1990; Risi et al. 2023). This study, therefore, adopts neo-institutional theory to underscore the critical role of external institutions in driving CSD practices and their potential to enhance financial performance.

Normative pressures, in particular, play a crucial role in shaping CSD practices by encouraging firms to align with societal norms and professional standards. The 2018 voluntary CSD guidelines exemplify these pressures, reflecting broader societal expectations for ethical and sustainable business practices. Unlike coercive mandates, these guidelines promote voluntary compliance, motivating firms to integrate sustainability into their core strategies rather than merely meeting minimum requirements. Such voluntary adherence fosters an ethical corporate culture that aligns with societal values and contributes to long-term legitimacy (Castelló and Lozano 2011; DiMaggio and Powell 1983; Meyer and Rowan 1977). As Velte (2020) suggest, normative pressures exerted by industry bodies and professional organizations prompt firms to adopt CSD not simply as a regulatory obligation but as part of their ethical and strategic priorities.

The 2018 voluntary guidelines thus enhance the value relevance of CSD by promoting transparency and ethical conduct (Gerged 2021). Firms that embrace these guidelines build long-term trust with stakeholders by signaling their commitment to sustainable practices, thereby enhancing their legitimacy and securing sustained financial performance (Suchman 1995). This reinforces the idea that normative pressures serve as a catalyst for ethical behavior, driving corporate engagement with CSD beyond mere regulatory compliance.

In contrast, coercive pressures arise from mandatory regulations and legal mandates. For instance, the 2017 CG reforms in Jordan, which introduced mandatory governance practices, including strengthened AC oversight, represent a significant coercive force that shapes corporate behavior (DiMaggio and Powell 1983; Meyer and Rowan 1977). These reforms compel firms to establish robust ACs to ensure compliance with CG requirements, reducing the risk of legal sanctions and preserving their legitimacy (Ni et al. 2015; Xie et al. 2019).

Under this coercive framework, ACs play a fundamental role in encouraging engagement with CSD practices. They ensure that firms adhere to regulatory standards set by bodies such as the Jordan Securities Commission (JSC, 2018), which strengthens investor confidence and contributes to improved financial performance (Ganda, 2018). By mitigating compliance risks and enhancing the credibility of sustainability reporting, ACs not only protect firms from legal repercussions but also improve their financial outcomes (Elmghaamez et al. 2024; Kuzey et al. 2023).

Audit committee characteristics play a pivotal moderating role in shaping the relationship between CSD and FP, especially under the influence of institutional pressures. From a coercive institutional perspective, regulatory mandates such as Jordan's 2017 CG reforms compel firms to establish more structured and accountable ACs, thereby enhancing their oversight capabilities. A larger AC, as found by Othman et al. (2014), tends to offer broader oversight, distributing workload and improving scrutiny over sustainability disclosures. This improved oversight aligns with coercive pressures that push firms to comply with externally imposed governance standards, thus strengthening the credibility of CSD and its financial implications.

Moreover, frequent AC meetings may signal enhanced diligence; however, consistent with agency theory (Fama and Jensen 1983), they can either foster stronger monitoring or create inefficiencies if poorly structured. In environments dominated by coercive pressures, such as mandatory disclosure regulations, frequent meetings may become procedural rather than strategic, potentially weakening the positive influence of CSD on FP (Gerged, Beddewela, and Cowton 2023).

Under normative pressures, stemming from societal and stakeholder expectations, AC expertise becomes crucial. Members with financial or sustainability-related knowledge are more capable of interpreting and guiding ESG reporting in a way that aligns with global best practices, thus enhancing disclosure quality (Fama and Jensen 1983). However, overreliance on technical expertise without a broader strategic view may limit the AC's effectiveness in leveraging CSD for firm value creation.

Independence of AC members bridges both coercive and normative dimensions. Coercively, independence is often mandated to avoid conflicts of interest; normatively, it reflects societal expectations for impartial governance. Independent AC members, as noted by Appuhami and Tashakor (2017), are instrumental

in evaluating ESG disclosures with objectivity, ensuring the reports serve broader stakeholder interests rather than managerial agendas. This oversight enhances stakeholder trust and mitigates managerial opportunism, reinforcing the legitimacy and financial utility of sustainability disclosures.

Thus, each AC attribute responds differently to normative and coercive institutional forces. While coercive pressures emphasize formal compliance and structural effectiveness, normative pressures highlight ethical alignment and professional expectations. The interaction of these pressures with AC characteristics significantly influences how firms utilize CSD to enhance financial outcomes.

Collectively, while coercive pressures ensure regulatory compliance, normative pressures drive deeper ethical engagement with CSD. Together, these forces shape corporate behavior and contribute to enhanced financial performance, with ACs playing a crucial role in balancing both types of institutional pressures.

2.3 | Previous Studies and Hypothesis Development

2.3.1 | The Impact of Normative Pressures on the Association Between CSD and Firm Value

Previous empirical studies examining the relationship between CSD and firm value have notable limitations, particularly the focus on developed countries such as the United States (Cek and Eyupoglu 2020; Harjoto and Laskmana, 2018), Korea (Lee and Jung 2016), and Italy (Menicucci and Paolucci, 2023), among others. Emerging economies, such as India (Al-Shaer and Zaman 2019; Bodhanwala and Bodhanwala, 2018; Bansal et al. 2021), Malaysia (Jan et al. 2019), and Turkey (Kalash 2021), have received comparatively less attention. While some studies have explored the CSD–firm value relationship in global contexts, such as developing countries' banks (Shakil et al. 2019) and industries across Europe and Asia (Bruna et al. 2022; Saeed et al. 2023), research in Jordan remains sparse, with studies by Al-Smadi et al. (2020) offering limited insights, particularly on the post-2017 CG reforms and the 2018 CSD guidelines. Most importantly, the existing literature lacks a theoretically driven empirical investigation of the role of voluntary sustainability reporting and mandatory CG requirements in reshaping the impact of ACs on the link between CSD and firm value.

Much of the existing literature attributes the positive link between CSD and firm value to corporate sustainability practices that enhance company reputation, operational efficiency, and stakeholder relationships, which in turn improve financial outcomes (Deegan 2002; Dmytriyev et al. 2021; Dumay et al. 2019). However, instead of relying on stakeholder or legitimacy theory to explain this connection, neo-institutional theory via normative pressures offers a more robust explanation. Normative institutional pressure suggests that firms adopt CSD to conform to societal norms, professional standards, and ethical expectations imposed by institutions such as industry bodies, NGOs, and global frameworks (DiMaggio and Powell 1983). These pressures drive companies to integrate sustainability practices not merely for financial gain but to meet the expectations of broader societal actors and align with professional norms (Castelló and Lozano 2011). By adhering to these norms, firms enhance their legitimacy and reputation, which, according to the theory, naturally leads to improved financial performance as they align more closely with socially accepted practices (Cormier and Magnan 2017; Sonpar et al. 2010).

In Jordan's context, the adoption of the 2018 CSD guidelines reflects normative pressures, compelling firms to disclose sustainability efforts to meet evolving societal and institutional expectations, which is expected to enhance FP (Kuzey et al. 2023). Therefore, based on normative institutional theory, we propose the following hypothesis:

H1. *The implementation of voluntary sustainability reporting guidelines, driven by normative institutional pressures, positively influences the relationship between corporate sustainability disclosure and financial performance in emerging economies.*

2.3.2 | The Moderating Role of Audit Committee Function From a Coercive Institutional Perspective

From an institutional theory perspective, particularly regarding coercive pressure, mandatory CG requirements, including the establishment of effective ACs, significantly enhance the value relevance of CSD. Coercive pressure, driven by regulatory bodies and legal mandates, compels firms to align their practices with established governance standards to avoid penalties and preserve legitimacy (DiMaggio and Powell 1983). The 2017 CG reforms in Jordan, which mandated stricter governance practices such as the establishment of ACs, exemplify this coercive force. These ACs ensure not only compliance with CSD requirements but also promote transparency, accountability, and trustworthiness, thereby improving financial performance by fostering investor confidence (Elmghaamez et al. 2024; Kuzey et al. 2023).

In Jordan's regulatory context, the effectiveness of ACs is a direct consequence of coercive institutional pressures from CG reforms. These pressures compel firms to adopt CSD practices that meet evolving CG standards, ultimately enhancing firm value. Drawing on previous research and the theoretical framework of institutional theory, particularly coercive pressures, we propose the following hypothesis:

H2. *Mandatory corporate governance reforms, including the establishment of effective audit committees, positively moderate the relationship between corporate sustainability disclosure and financial performance by reinforcing compliance through coercive pressure.*

3 | Research Design

3.1 | Data and Sampling Criteria

This study's sample was drawn from all Jordanian companies listed on the ASE, including financial, services, industrial, and unlisted companies, over the period 2014–2022. The final

sample comprises 207 listed and unlisted companies across 9 years, totaling 1863 firm-year observations (see Table 1). The sample distribution reflects the sectoral composition of the Jordanian economy: the financial sector accounts for approximately 46.38% of the sample (e.g., Alhaddad et al. 2022), the services sector 20.77% (e.g., Alzboun et al. 2016; Obeidat 2016), and the industrial sector 18.84% (e.g., Altarawneh 2015; Omar and Zallom 2016; Zraqat et al. 2021). Additionally, unlisted companies represent 14.01% of the sample. Notably, this study is the first in Jordan to include unlisted companies.

The sampling criteria were carefully selected for several reasons. First, the study period begins after the introduction of the Jordanian CG Code in 2009 (JCGC 2017). Second, the sample period includes the CG update in 2017, which mandates all Jordanian companies to disclose information regarding their BOD and ACs. Third, the sample period includes the introduction of sustainability reporting guidelines by the ASE in 2018 (ASE, 2018).

TABLE 1 | Sample details.

Sector	No. firms	No. obs	Sample (%)
Financial	96	864	46.38
Services	43	351	20.77
Industrial	39	387	18.84
Unlisted companies	29	261	14.01
Total	207	1863	100

TABLE 2 | The operational definitions of research variables.

Variables	Operational definition
Dependent variables	
ROA	Net income divided by total assets
ROE	Net income divided by shareholders' equity
Tobin's Q	The (market value of equity + book value of short-term liabilities) / book value of assets
Independent variables	
CSD	The corporate sustainability disclosure (*CSD*) index includes 197 items: 117 social, 61 environmental, and 19 economic developed for this study's purposes. An unweighted CSD index format is adopted in this study to avoid the subjectivity and inconsistency associated with assigning varying degrees of importance to specific items—a problem often encountered when different researchers apply their own weighting scales (Ahmed and Courtis 1999). In this approach, any item disclosed in the annual report is given a score of one, and items that are not disclosed are scored zero (Cooke 1992; Depoers 2000; Gerged et al. 2018; Ntim 2016). Therefore, the overall CSD index for a company is determined by simply tallying these scores. See the following formula: $CSD = \frac{\sum_{i=1}^{n} di}{197}$ where *CSD* represents the corporate sustainability disclosure score, *di* denotes each item disclosed, and 197 refers to the total count of CSD items.
EC	The economic disclosure (EC) subindex includes 19 economic disclosure items out of 197 sustainability disclosure items included in the *CSD* index. The overall EC subindex for a company is determined by simply tallying these scores. See the following formula: $EC = \frac{\sum_{i=1}^{n} di}{19}$ where *CSD* represents the corporate sustainability disclosure score, *di* denotes each item disclosed, and 19 refers to the total count of *EC* items.
ENV	The environmental disclosure (*ENV*) subindex includes 61 environmental items out of 197 sustainability disclosure items included in the *CSD* index. The overall *ENV* subindex for a company is determined by simply tallying these scores. See the following formula: $ENV = \frac{\sum_{i=1}^{n} di}{61}$ where *CSD* represents the corporate sustainability disclosure score, di denotes each item disclosed, and 61 refers to the total count of *ENV* items.

(Continues)

TABLE 2 | (Continued)

Variables	Operational definition
SOD	The social disclosure (*SOD*) subindex includes 117 social items out of 197 sustainability disclosure items included in the *CSD* index. The overall *SOD* subindex for a company is determined by simply tallying these scores. See the following formula: $SOD = \frac{\sum_{i=1}^{n} di}{117}$ where *CSD* represents the corporate sustainability disclosure score, *di* denotes each item disclosed, and 117 refers to the total count of *CSD* items.
Moderating Variables	
ACSIZE	Number of members in the committee.
ACMEET	Number of audit committee meetings held by year.
ACIND	The proportion of independent members in the committee.
ACEXP	The number of members who have accounting or financial background/experience.
Control variables	
B SIZE	The number of directors on the boards of Jordanian companies.
BMEET	The number of meetings held by the board of directors per year.
BIND	The proportion of independent members on the board of directors.
BGEND	The proportion of female members on the board of directors.
CEOD	A dummy variable is given 1 if the same CEO occupies the position of Chairperson and is given 0 otherwise.
INSOWN	Institutional ownership represents the percentage of common shares owned by institutional investors.
FROWN	Foreign ownership refers to the percentage of common shares owned by foreign investors (non-Jordanian).
MANOWN	Managerial ownership refers to the percentage of shares held by board members and their relatives in relation to the total number of outstanding shares.
Leverage	Debt to assets ratio (DOA)
FSIZE	Total assets
Big4	Auditing type is a dummy variable is given 1 if the company was audited by one of the big four auditing companies and given 0 otherwise. The big four auditing companies are Deloitte, Ernst & Young (EY), PricewaterhouseCoopers (PwC), and Klynveld Peat Marwick Goerdeler (KPMG).
Listing status	A dummy variable is given 1 if the company was listed at Amman Stock Exchange (ASE) and 0 otherwise.

Data were collected from various sources, including annual reports, sustainability/CSR reports, and company websites. Unlike a stream of previous studies that have mainly used existing databases, such as Thomson Reuters Eikon and Bloomberg to measure sustainability/ESG/CSR disclosure (e.g., Alareeni and Hamdan 2020; Buallay and Al-Ajmi 2020; Chen and Xie 2022; Kim and Lee 2020; Park 2023; Saeed et al. 2023), our study employs a hand-collected disclosure index, which was developed based on previous research, the SDGs (2017), and the GRI (2006). This CSD index includes 197 items: 117 social, 61 environmental, and 19 economic, developed for this study's purposes. To ensure the relevance of the constructed CSD index to the Jordanian context, it was refined through a pilot study that incorporated country-specific elements and strengthened its methodological rigor.

3.2 | Research Variables

Table 2 provides definitions for the research variables. The dependent variables include return on assets (*ROA*), return on equity (*ROE*), and Tobin's *Q*. The independent variables are corporate sustainability disclosure (*CSD*), including economic (*EC*), environmental (*ENVD*), and social (*SOC*) disclosures. A disclosure index may be structured as either weighted or unweighted. The unweighted format is frequently used in annual report analyses because it avoids the subjectivity and inconsistency associated with assigning varying degrees of importance to specific items—a problem often encountered when different researchers apply their own weighting scales (Ahmed and Courtis 1999). In this approach, any item disclosed in the annual report is given a score of one, and items that are not

disclosed are scored zero (Cooke 1992; Depoers 2000; Gerged et al. 2018; Ntim 2016). Therefore, the overall *CSD* index for a company is determined by simply tallying these scores. See the following formulate:

$$CSD = \frac{\sum_{i=1}^{n} di}{\mathrm{n}}$$

where *CSD* represents the corporate sustainability disclosure score, *di* denotes each item disclosed, and n refers to the total count of disclosure items.

Regarding AC mechanisms, the study considers audit committee size (*ACSIZE*), audit committee meetings (*ACMEET*), audit committee independence (*ACIND*), and audit committee expertise (*ACCEXP*), in line with prior research (Buallay and Al-Ajmi 2020; Mohammadi et al. 2021; Pozzoli et al. 2022). The control variables were selected in line with previous CG and sustainability reporting literature, including board size (*BSIZE*), board meetings (*BMEET*), board independence (*BIND*), and board gender diversity (*BGEND*) (Gerged 2021; Mohammadi et al. 2021), institutional ownership (*INSOWC*) (Gerged 2021; Qaderi et al. 2020), foreign ownership (*FROWN*) and managerial ownership (*MANOWN*) (Kumar et al., 2022), CEO duality (*CEOD*) (e.g., Gerged 2021; Xie et al. 2019), firm size (*FSIZE*) (Park 2023; Phang et al. 2023; Saeed et al. 2023), leverage (*DOA*) (Gerged 2021; Phang et al. 2023), auditor type measured by Big 4 auditors (*Big4*) (Gerged 2021; Phang et al. 2023), and listed status, which scores 1 if the company is listed on ASE and zeroed otherwise (See Table 2 for further details).

To investigate the moderating effect of AC function on the relationship between CSD and FP in Jordan, the study utilizes a PQR model (Cobb-Clark et al. 2016; Powell 2022). This model is supplemented with a two-stage PQR to address potential endogeneity (Heras et al. 2018).

3.3 | Econometric Models

Following Powell (2022), we examine the effect of ACs' function on the relationship between CSD and financial performance in Jordan pre- and post-2017 CG mandatory requirements and the 2018 CSD voluntary guidelines using a PQR model. Traditional least squares regression estimates the conditional mean of target variables; however, a PQR model estimates the conditional median, providing a more robust analysis, particularly in the presence of outliers. The PQR model offers a more comprehensive understanding of the moderating effect of AC characteristics on the CSD–FP relationship compared with traditional models such as fixed effects or OLS (e.g., Gerged 2021; Xie et al. 2019; Nizam et al. 2019). The PQR model is advantageous due to its robustness to outliers and its semi-parametric nature, which does not rely on assumptions about the parametric distribution of errors (Powell 2022).

The PQR model without the interaction between CSD and ACF is specified as follows:

$$\begin{aligned} FP_{it} = {} & \beta_0 + \beta_1 SD_{it} + \beta_2 ACZ_{it} + \beta_3 ACM_{it} + \beta_4 ACI_{it} \\ & + \beta_5 ACE_{it} + \beta_n CONTROL_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

The PQR model with the interaction between *CSD* and *AC* characteristics is specified as follows:

$$\begin{aligned} FP_{it} = {} & \beta_0 + \beta_1 CSD_{it} + \beta_2 ACZ * CSD_{it} + \beta_3 ACM * CSD_{it} \\ & + \beta_4 ACI * CSD_{it} + \beta_5 ACE * CSD_{it} + \beta_6 ACZ_{it} \\ & + \beta_7 ACM_{it} + \beta_8 ACI_{it} + \beta_9 ACE_{it} + \beta_n CONTROL_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

where *FP* represents financial performance, proxied by *ROA*, *ROE*, and Tobin's *Q*. *CSD* denotes the corporate sustainability disclosure score, including environmental, economic, and social disclosure items. *ACZ*, *ACM*, *ACI*, and *ACE* represent AC size, meetings, independence, and expertise, respectively. The control variables include *BSIZE* (board size), *BMEET* (board meetings), *BIND* (board independence), *BGEND* (board gender diversity), *INSOWN* (institutional ownership), *FROWN* (foreign ownership), *MANOWN* (managerial ownership), *CEOD* (CEO duality), *FSIZE* (firm size), *DOA* (debt-to-asset ratio as a proxy for leverage), *Big4* (auditor type), and listed status.

4 | Empirical Findings

4.1 | Univariate Analysis

The data presented in Table 3 provide a detailed analysis of CSD trends among Jordanian companies from 2014 to 2022, reflecting an overall increase in sustainability reporting across sectors. Panel A shows that, on average, CSD for all companies was 13.29%, with a steady rise from 11.89% in 2014 to 17.17% in 2022. Notably, economic disclosure saw the most significant growth, increasing from 15.67% in 2014 to 27.71% in 2022, reflecting an average of 18.67%. Environmental disclosure, although consistently lower, still showed improvement, rising from 5.84% in 2014 to 11.01% in 2022, with an average of 7.26%. Social disclosure, with an average of 15.57%, also increased over the years, from 14.41% in 2014 to 18.65% in 2022. These trends suggest that Jordanian companies are progressively enhancing their transparency, especially in economic matters, though environmental disclosures lag behind.

Panel B, which focuses on the financial sector, reveals a lower overall sustainability disclosure average of 10.58%, with an increase from 9.67% in 2014 to 13.67% in 2022. Economic disclosure followed a similar upward trajectory, rising from 14.14% in 2014 to 23.03% in 2022, with an average of 15.86%. However, environmental disclosure in this sector remained minimal, averaging only 2.05%, increasing from 1.54% to 3.77% during the study period. Social disclosure, averaging 14.17%, rose steadily from 13.18% in 2014 to 17.32% in 2022. The financial sector's low environmental disclosure indicates limited focus on sustainability, though the growth in economic and social disclosures points to increasing recognition of broader CG responsibilities.

In the service sector, shown in Panel C, sustainability disclosure averaged 16.9%, with an increase from 14.96% in 2014 to 20.16% in 2022. Economic disclosure in this sector saw considerable growth, from 14.93% to 30.97%, averaging 19.71%. Environmental disclosure averaged 11.49%, rising from 9.53% to 15.48%, indicating growing attention to environmental issues.

TABLE 3 | Levels, trends and patterns of corporate sustainability disclosure in Jordan over the period of analysis (%).

Panel A: Subindex	All	2014	2015	2016	2017	2018	2019	2020	2021	2022
Sustainability disclosure	13.29	11.89	12.23	12.43	12.68	12.78	13.00	13.07	14.92	17.16
Economic disclosure	18.67	15.74	15.94	15.91	16.32	16.37	16.65	19.30	24.76	27.71
Environmental disclosure	7.26	5.84	6.19	6.59	6.83	6.94	7.12	7.39	8.79	11.01
Social disclosure	15.57	14.41	14.78	14.91	15.14	15.24	15.47	15.01	16.52	18.65
Panel B: Financial sector										
Sustainability disclosure	10.58	9.67	9.79	9.89	10.05	10.12	10.21	10.52	11.39	13.67
Economic disclosure	15.86	14.14	13.76	13.60	13.87	13.98	14.00	17.32	19.30	23.03
Environmental disclosure	2.05	1.54	1.61	1.69	1.86	1.90	1.93	2.10	2.60	3.77
Social disclosure	14.17	13.18	13.42	13.56	13.69	13.78	13.91	13.82	14.69	17.32
Panel C: Service sector	All	2014	2015	2016	2017	2018	2019	2020	2021	2022
Sustainability disclosure	16.49	14.98	15.61	15.80	16.00	15.98	16.10	16.17	18.49	20.16
Economic disclosure	19.71	14.93	16.16	16.03	16.65	16.77	16.98	21.54	29.19	30.97
Environmental disclosure	11.49	9.53	10.41	10.75	11.28	11.32	11.74	12.00	13.27	15.48
Social disclosure	18.58	17.83	18.23	18.39	18.37	18.29	18.27	17.47	19.48	20.85
Panel D: Industrial sector	All	2014	2015	2016	2017	2018	2019	2020	2021	2022
Sustainability disclosure	17.76	14.96	15.57	16.20	17.01	17.53	18.03	17.75	20.53	23.00
Economic disclosure	24.82	19.43	20.51	21.46	22.27	22.40	23.48	23.75	33.87	36.44
Environmental disclosure	15.37	12.02	12.53	13.87	14.38	14.96	15.26	16.02	18.33	22.19
Social disclosure	17.86	15.76	16.35	16.57	17.53	17.77	18.58	17.69	19.50	21.24
Panel E: Unlisted firms	All	2014	2015	2016	2017	2018	2019	2020	2021	2022
Sustainability disclosure	11.54	10.52	10.82	10.80	10.66	10.69	10.94	10.55	13.78	16.37
Economic disclosure	18.21	17.24	16.70	15.97	16.00	15.61	16.88	16.90	24.14	26.68
Environmental disclosure	7.31	6.33	6.61	6.84	6.56	6.33	6.50	6.44	9.83	13.28
Social disclosure	12.67	11.61	10.82	10.80	10.66	10.69	10.94	10.55	13.78	16.30

Social disclosure averaged 18.58%, with a rise from 17.83% to 20.85%. These figures highlight the service sector's higher engagement with sustainability compared with other sectors, especially in economic and social dimensions.

Panel D, which covers the industrial sector, shows the highest overall sustainability disclosure average of 17.76%, increasing from 14.96% in 2014 to 23% in 2022. Economic disclosure was particularly strong in this sector, averaging 24.82% and rising from 19.43% to 36.44%. Environmental disclosure also saw significant improvement, from 12.02% in 2014 to 22.19% in 2022, with an average of 15.37%. Social disclosure averaged 17.86%, increasing from 15.76% to 21.24%. The industrial sector's higher levels of economic and environmental disclosures suggest that sustainability concerns are more integrated into its core business practices.

Lastly, Panel E, focusing on unlisted firms, reveals lower average sustainability disclosure levels at 11.54%, with an increase from 10.52% in 2014 to 16.37% in 2022. Economic disclosure in this group averaged 18.21%, increasing from 17.24% to 26.68%. Environmental disclosure remained modest, averaging 7.31%, with a rise from 6.33% to 13.28%. Social disclosure averaged 12.67%, rising from 11.61% to 16.30%. Unlisted firms exhibit slower growth in CSD, particularly in environmental areas, likely reflecting fewer regulatory pressures compared with listed companies.

Overall, the data from Table 3 demonstrate a clear upward trend in CSD across Jordanian companies, with significant progress in economic and social disclosures. However, environmental disclosure remains relatively low, particularly in the financial and unlisted sectors, indicating potential areas for improvement in aligning corporate practices with sustainability goals.

Table 4 presents the descriptive statistics for the research variables. The mean return on assets (*ROA*) is 0.616%, with a standard deviation of 7.93%, which aligns with prior studies on Jordanian firms (Alkurdi et al. 2019). Return on equity (*ROE*)

TABLE 4 | Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
TBQ	1863	1.121	2.314	0	96
ROA	1863	0.616	7.931	−46.21	60.18
ROE	1863	3.395	18.516	−152	486
CSD	1863	0.133	0.066	0.03	0.365
ECD	1863	0.187	0.105	0	0.579
ENVD	1863	0.073	0.081	0	0.393
SOD	1863	0.156	0.068	0.034	0.393
ACSIZE	1372	3.22	0.632	1	7
ACMEET	1372	4.828	2.048	1	21
ACIND	1372	1.845	1.018	0	5
ACEXP	1372	1.431	1.091	0	6
B SIZE	1863	7.779	2.387	3	13
BMEET	1863	7.681	2.717	1	31
BIND	1863	3.209	1.975	0	11
BGEND	1863	0.388	0.774	0	5
CEOD	1863	0.084	0.278	0	1
INSOWN	1863	40.178	31.662	0	100
FROWN	1863	19.1	25.997	0	100
MANOWN	1863	2.618	7.325	0	65.3
Leverage	1863	12.747	17.946	0	96.88
FSIZE	1863	7.48	0.858	4.444	10.709
Big4	1863	0.422	0.494	0	1
Listing status	1863	0.86	0.347	0	1

Note: Research variables are operationally defined in Table 1.

shows a mean of 3.395% with a higher variation (standard deviation of 18.52%), consistent with findings from similar emerging economies. Tobin's *Q* (*TBQ*) has a mean of 1.121% and a wider range, from 0 to 96, suggesting considerable variation in market valuation across firms.

The mean *CSD* score is 13.3%, with a standard deviation of 6.6%, which is lower than other emerging economies, such as Saudi Arabia (Ammer et al. 2020). Environmental disclosure (*ENVD*) in Jordan has a mean of 7.3%, close to Gerged's (2021) findings of 8.40%. Social disclosure (*SOD*) averages 15.6%, consistent with emerging markets, like the 16.1% found by Ebaid (2023) in Saudi Arabia.

For CG, the average audit committee size (*ACSIZE*) is 3.22 members, aligning with Jordanian governance requirements (Azzoz and Khamees 2016). The mean number of audit committee meetings (*ACMEET*) is 4.83, slightly exceeding the recommendation of four annual meetings. Audit committee independence (*ACIND*) has a mean of 1.85, which is lower than the 2.77 reported by Arif et al. (2021) in Saudi Arabia, indicating weaker oversight in Jordan. Audit committee expertise (*ACEXP*) averages 1.43 members, slightly higher than in Turkey (Biçer and Feneir, 2019).

Board meetings (*BMEET*) average 7.68, consistent with prior studies (Gerged 2021). Board independence (*BIND*) shows a mean of 3.21, suggesting low compliance with Jordan's governance code, which mandates higher independence. Leverage has a mean value of 12.75%, which is lower than in other emerging markets (Gebrayel et al. 2018), while institutional ownership (*INSOWN*) averages 40.18%, lower than other studies (Qaderi et al. 2020).

CEO duality (*CEOD*) compliance stands at 8.4%, indicating higher adherence to governance guidelines compared with Saudi Arabia (Al-Matari et al. 2022). Firm size (*FSIZE*) averages 7.48, higher than in other emerging markets (Zahid et al. 2020), while 42% of firms are audited by one of the Big 4 audit firms. This relatively low Big 4 presence may suggest a weaker emphasis on external audit quality.

4.2 | Bivariate Analysis

The correlation matrix in Table 5 reveals several key relationships between the research variables, offering insights into their interactions and consistency with previous studies. *TBQ* shows weak positive correlations with both *ROA* (0.133) and *ROE* (0.138), consistent with earlier findings suggesting that market-based performance metrics do not always strongly align with accounting-based measures (Alkurdi et al. 2019). *ROA* and *ROE* display a stronger correlation (0.365), reflecting the interconnectedness of profitability metrics, a relationship also identified by Makhlouf et al. (2018).

CSD is modestly correlated with *ROA* (0.120) and more strongly with *ROE* (0.190), indicating that higher sustainability disclosures are linked to better accounting performance, as observed in prior research (Ebaid 2023). The correlation between CSD and *TBQ* is weaker (0.029), suggesting that market-based measures might not fully integrate sustainability disclosures, possibly because these disclosures have yet to be fully incorporated into investor decision-making (Ammer et al. 2020). Strong positive correlations exist between CSD and its components—environmental (*ENVD*), economic (*ECD*), and social disclosures (*SOD*)—with the highest between *CSD* and *SOD* (0.923), echoing findings from Gerged (2021) regarding the strong link between sustainability components. Although *CSD* is strongly correlated with its three main components, this should not pose a statistical problem, as they will not be used collectively in a single regression. Instead, they will be used as alternative measures for CSD in the additional analysis sub-section.

Audit committee size (*ACSIZE*) demonstrates positive but weak correlations with *ROA* (0.047) and *ROE* (0.094), implying a small positive influence on financial performance, consistent with Gerged (2021). Its moderate correlation with *CSD* (0.215) suggests that AC size plays a modest role in promoting sustainability disclosures. Conversely, audit committee

TABLE 5 | Matrix of correlations.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) *TBQ*	1.000											
(2) *ROA*	0.133	1.000										
(3) *ROE*	0.138	0.365	1.000									
(4) *CSD*	0.029	0.120	0.190	1.000								
(5) *ECD*	0.009	0.025	0.070	0.756	1.000							
(6) *ENVD*	0.065	0.101	0.117	0.838	0.628	1.000						
(7) *SOD*	0.004	0.128	0.222	0.923	0.589	0.584	1.000					
(8) *ACSIZE*	0.011	0.047	0.094	0.215	0.069	0.072	0.292	1.000				
(9) *ACMEET*	0.052	0.079	0.081	0.136	−0.006	−0.056	0.262	0.191	1.000			
(10) *ACIND*	−0.087	−0.061	0.052	−0.001	−0.032	−0.043	0.034	0.201	0.099	1.000		
(11) *ACEXP*	−0.069	0.013	0.003	0.147	0.033	−0.032	0.254	0.365	0.121	0.026	1.000	
(12) *B_SIZE*	−0.051	0.105	0.188	0.412	0.173	0.181	0.521	0.349	0.289	0.121	0.268	1.000
(13) *BMEET*	0.080	0.063	0.091	0.089	0.013	0.065	0.103	0.091	0.228	0.011	−0.046	0.030
(14) *BIND*	−0.098	−0.023	0.028	0.072	−0.028	0.018	0.115	0.053	0.092	0.665	0.022	0.403
(15) *BGEND*	−0.038	0.085	0.134	0.109	0.008	−0.053	0.212	0.167	0.171	0.011	0.198	0.250
(16) *CEOD*	0.045	0.033	0.021	−0.154	−0.156	−0.107	−0.145	−0.047	−0.028	0.093	−0.094	−0.145
(17) *INSOWN*	0.053	0.063	0.064	0.099	0.055	−0.050	0.182	0.215	0.108	−0.214	0.230	0.119
(18) *FROWN*	−0.035	0.043	0.068	0.202	0.091	0.056	0.275	0.219	−0.013	0.017	0.272	0.201
(19) *MANOWN*	0.149	0.008	−0.019	−0.095	−0.106	−0.044	−0.101	−0.077	−0.076	0.088	−0.130	−0.104
(20) *Leverage*	0.010	−0.172	0.051	0.256	0.254	0.256	0.194	0.079	−0.026	−0.032	0.152	0.160
(21) *FSIZE*	−0.017	0.155	0.217	0.542	0.242	0.185	0.715	0.349	0.369	0.072	0.387	0.586
(22) *Big4*	0.076	0.168	0.125	0.285	0.120	0.067	0.398	0.213	0.219	−0.159	0.291	0.348
(23) Listing status	−0.248	0.229	−0.012	0.086	−0.022	0.014	0.138	0.039	0.080	−0.061	0.129	0.058

TABLE 5 | (Continued)

Variables	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
(1) *TBQ*											
(2) *ROA*											
(3) *ROE*											
(4) *CSD*											
(5) *ECD*											
(6) *ENVD*											
(7) *SOD*											
(8) *ACSIZE*											
(9) *ACMEET*											
(10) *ACIND*											
(11) *ACEXP*											
(12) *B_SIZE*											
(13) *BMEET*	1.000										
(14) *BIND*	−0.013	1.000									
(15) *BGEND*	0.010	0.010	1.000								
(16) *CEOD*	−0.073	0.019	−0.045	1.000							
(17) *INSOWN*	0.022	−0.292	0.151	−0.114	1.000						
(18) *FROWN*	−0.143	0.046	−0.001	−0.089	0.276	1.000					
(19) *MANOWN*	−0.055	0.043	−0.022	0.231	−0.197	−0.046	1.000				
(20) *Leverage*	0.112	−0.012	0.064	−0.088	0.123	0.034	−0.102	1.000			
(21) *FSIZE*	0.145	0.145	0.207	−0.149	0.316	0.333	−0.171	0.283	1.000		
(22) *Big4*	0.075	−0.081	0.146	−0.080	0.371	0.225	−0.164	0.037	0.492	1.000	
(23) Listing status	0.074	−0.033	0.100	0.010	0.092	0.037	0.022	−0.042	0.211	0.116	1.000

Note: Research variables are operationally defined in Table 1.

independence (*ACIND*) shows negative correlations with *TBQ* (−0.087) and *ROA* (−0.061), indicating that independent committees may not directly enhance performance in this context, contrasting with studies from other emerging markets like Saudi Arabia (Arif et al. 2021). Audit committee expertise (*ACEXP*) exhibits a moderate positive correlation with *CSD* (0.147), which is in line with research emphasizing the significance of financial expertise in advancing sustainability reporting (Biçer and Feneir, 2019).

Board size (*B_SIZE*) shows a moderate positive correlation with *CSD* (0.412), supporting the notion that larger boards tend to advocate for greater transparency and disclosure (Azzoz and Khamees 2016). Additionally, board size is positively correlated with *ROA* (0.105) and *ROE* (0.188), consistent with prior findings suggesting that larger boards can enhance firm oversight and performance. Board independence (*BIND*), however, exhibits weaker correlations with *CSD* (0.072) and *TBQ* (−0.098), suggesting that independent boards may have a limited direct impact on sustainability disclosures or market performance in this sample, reflecting results from emerging markets like Malaysia (Zahid et al. 2020).

Institutional ownership (*INSOWN*) displays modest positive correlations with *CSD* (0.099) and *ROA* (0.063), supporting the view that institutional investors promote better disclosure and performance, as observed by Qaderi et al. (2024). In contrast, foreign ownership (*FROWN*) and managerial ownership (*MANOWN*) show weaker correlations with *CSD* and financial performance, suggesting that their influence may be less significant in Jordan compared with other contexts.

Firm size (*FSIZE*) is strongly correlated with *CSD* (0.542), indicating that larger firms are more likely to engage in sustainability reporting, likely due to greater resources and external pressures (Makhlouf et al., 2018). Additionally, *FSIZE* exhibits moderate positive correlations with *ROA* (0.155) and *ROE* (0.217), suggesting that larger firms tend to be more profitable.

Overall, the correlation matrix highlights the role of governance mechanisms, sustainability reporting, and firm characteristics in shaping financial performance, consistent with previous research. While AC and board variables generally align with earlier findings, the weaker relationships between *CSD* and market-based performance metrics like *TBQ* suggest that investors in Jordan may not yet fully appreciate the value of sustainability disclosures. In contrast, the stronger correlations between *CSD* and accounting-based performance measures such as ROA and ROE underscore the importance of internal governance in promoting sustainable practices.

4.3 | Panel Quantile Regression Analysis

4.3.1 | The Role of Normative Pressures in Reshaping the CSD–FP Nexus

The results presented in Table 6, using Powell's (2022) PQR, analyze the link between CSD and FP proxies (*ROA*, *ROE*, *TBQ*) pre- and post-2018 voluntary sustainability reporting guidelines in Jordan. The findings offer insights into the impact of CSD on FP across various quantiles, reflecting the influence of normative institutional forces.

Before the 2018 sustainability reporting guidelines, *CSD* positively influenced Tobin's *Q* (*TBQ*), return on assets (*ROA*), and return on equity (*ROE*), as reflected in the significant results at both the 0.25 and 0.75 quantiles. For *TBQ*, *CSD* has a significant positive impact at both quantiles (0.25: 0.397, $p < 0.01$; 0.75: 1.3, $p < 0.01$), indicating that sustainability disclosures boost market-based performance across firms. Similarly, ROA (0.25: 0.79, $p < 0.01$; 0.75: 17.625, $p < 0.01$) and ROE (0.25: 6.856, $p < 0.01$; 0.75: 5.907, $p < 0.01$) show strong positive relationships, suggesting that CSD supports improved accounting-based performance metrics. These results align with prior research, which suggests that CSD enhances corporate reputation, thereby increasing investor confidence and improving financial outcomes (Cormier and Magnan 2017).

Following the introduction of voluntary sustainability reporting guidelines in 2018, the impact of CSD on FP remains robust, with significant improvements noted across the financial performance proxies. For *TBQ*, the results at the 0.25 quantile show a positive and significant effect (0.479, $p < 0.01$), and this effect strengthens at the 0.75 quantile (1.014, $p < 0.01$). *ROA* continues to reflect significant positive impacts of *CSD* post-2018 (0.25: 6.901, $p < 0.01$; 0.75: 23.305, $p < 0.01$), and *ROE* also exhibits strong positive effects (0.25: 5.694, $p < 0.01$; 0.75: 29.613, $p < 0.01$). These results suggest that firms that voluntarily comply with the new sustainability guidelines are rewarded with improved financial performance. The stronger post-2018 relationships highlight the increasing importance of sustainability in firm strategies, driven by both normative pressures from societal expectations and increasing investor demand for ESG-related transparency.

The results, when viewed through the lens of normative institutional theory, indicate that societal expectations for corporate responsibility and sustainability reporting have increasingly shaped firm behavior in Jordan. The positive and significant relationships between CSD and FP, both pre- and post-2018, demonstrate that firms responding to these normative pressures are more likely to experience enhanced financial outcomes. As suggested by previous studies (Velte 2020), sustainability reporting reflects a firm's ethical stance and transparency, fostering trust among stakeholders and ultimately boosting financial performance. The post-2018 results underscore the growing influence of sustainability on firm valuation, as companies align their strategies with global standards like the GRI and the SDGs, responding to both normative expectations and evolving investor preferences for ESG integration (Ortas et al. 2015).

Regarding the AC characteristics, the results show that *ACSIZE* has a generally positive effect on FP, with a stronger influence post-guidelines (e.g., its impact on *ROA* is significant at the 0.25 quantile, increasing from 0.053 to 0.685). *ACMEET* shows mixed results, with negative effects on *ROA* and *ROE* but slightly positive effects on *TBQ* post-guidelines. This may suggest that frequent AC meetings might not always enhance financial performance due to potential inefficiencies. *ACIND* generally shows negative effects on ROA and positive

TABLE 6 | Conducting Powell's (2022) PQR to explore the impact of normative pressure (2018 sustainability disclosure guidelines) on the CSD–FP nexus.

	CSD and FP proxies *before* the 2018 sustainability disclosure guidelines						**CSD and FP proxies *after* 2018 sustainability disclosure guidelines**					
Model	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
Quantile	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**
Dependent	***TBQ***	***TBQ***	**ROA**	**ROA**	**ROE**	**ROE**	***TBQ***	***TBQ***	**ROA**	**ROA**	**ROE**	**ROE**
CSD	0.397***	1.3***	0.79***	17.625***	6.856***	5.907***	0.479***	1.014***	6.901***	23.305***	5.694***	29.613***
	(0.026)	(0.045)	(0.305)	(0.12)	(1.879)	(1.539)	(0.034)	(0.095)	(0.295)	(0.262)	(0.634)	(0.849)
ACSIZE	0.033***	0.059***	0.053	0.105***	0.301***	0.265***	0.01***	0.021**	0.685***	0.617***	0.68***	0.32*
	(0.004)	(0.003)	(0.034)	(0.027)	(0.096)	(0.085)	(0.004)	(0.01)	(0.017)	(0.015)	(0.059)	(0.171)
ACMEET	−0.006***	0.001	−0.029***	−0.122***	−0.378***	−0.026	−0.009***	0.005***	−0.168***	−0.078***	−0.204***	−0.117***
	(0.000)	(0.001)	(0.01)	(0.002)	(0.056)	(0.028)	(0.001)	(0.001)	(0.01)	(0.009)	(0.023)	(0.031)
ACIND	−0.014***	−0.051***	−0.185***	−0.103***	0.362***	−1.515***	−0.014***	−0.06***	−0.022**	0.114***	0.017	−0.162**
	(0.002)	(0.002)	(0.025)	(0.004)	(0.113)	(0.053)	(0.001)	(0.005)	(0.01)	(0.008)	(0.074)	(0.063)
ACEXP	−0.032***	−0.044***	−0.331***	−0.32***	−0.128	0.103	−0.023***	−0.012**	−0.671***	−0.237***	−1.053***	−0.636***
	(0.001)	(0.002)	(0.019)	(0.008)	(0.214)	(0.064)	(0.001)	(0.005)	(0.009)	(0.025)	(0.157)	(0.036)
B_SIZE	0.000	−0.01***	0.29***	0.228***	0.475***	0.665***	−0.021***	−0.025***	0.134***	0.079***	0.419***	0.278***
	(0.001)	(0.001)	(0.017)	(0.005)	(0.056)	(0.126)	(0.001)	(0.002)	(0.007)	(0.004)	(0.029)	(0.03)
BMEET	0.003***	0.027***	0.068***	0.191***	0.143***	0.385***	−0.005***	−0.005***	0.073***	0.187***	0.078**	0.306***
	(0.001)	(0.001)	(0.012)	(0.003)	(0.038)	(0.029)	(0.000)	(0.002)	(0.005)	(0.008)	(0.037)	(0.02)
BIND	0.004***	0.008***	0.207***	−0.024***	−0.403***	0.526***	0.007***	−0.003	−0.087***	0.04***	−0.284***	0.009
	(0.001)	(0.001)	(0.024)	(0.007)	(0.141)	(0.08)	(0.002)	(0.003)	(0.01)	(0.007)	(0.032)	(0.029)
BGEND	0.009**	0.038***	0.252***	0.012	0.662***	−0.446***	0.028***	0.015***	0.434***	0.518***	0.126	0.155**
	(0.004)	(0.002)	(0.034)	(0.033)	(0.214)	(0.096)	(0.002)	(0.004)	(0.016)	(0.011)	(0.204)	(0.067)
CEOD	−0.047***	0.167***	−0.42***	0.922***	0.2	0.902	0.035**	0.201***	1.518***	1.323***	2.286***	2.737***
	(0.005)	(0.011)	(0.084)	(0.06)	(0.52)	(0.733)	(0.014)	(0.012)	(0.09)	(0.095)	(0.462)	(0.302)
INSOWN	0.002***	0.000**	0.013***	0.005***	−0.006	−0.007*	0.000	0.001***	−0.012***	−0.001***	−0.023***	−0.004***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.005)	(0.004)	(0.000)	(0.000)	(0.001)	(0.000)	(0.003)	(0.001)
FROWN	0.001***	0.000***	−0.007***	0.012***	−0.015***	0.006*	0.001***	0.000	−0.001	0.015***	0.034***	0.041***
	(0.000)	(0.000)	(0.002)	(0.001)	(0.004)	(0.003)	(0.000)	(0.000)	(0.001)	(0.001)	(0.003)	(0.003)
MANOWN	0.008***	0.017***	0.011**	0.031***	0.015	0.085***	−0.001*	0.019***	−0.031***	−0.046***	−0.008	0.006
	(0.000)	(0.000)	(0.005)	(0.001)	(0.019)	(0.029)	(0.000)	(0.001)	(0.002)	(0.001)	(0.01)	(0.009)

(Continues)

TABLE 6 | (Continued)

	CSD and FP proxies *before* the 2018 sustainability disclosure guidelines						CSD and FP proxies *after* 2018 sustainability disclosure guidelines					
Model	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
Quantile	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**
Dependent	***TBQ***	***TBQ***	**ROA**	**ROA**	**ROE**	**ROE**	***TBQ***	***TBQ***	**ROA**	**ROA**	**ROE**	**ROE**
Leverage	0.002***	0.000	−0.069***	−0.031***	−0.177***	−0.016***	0.003***	0.001***	−0.106***	−0.018***	−0.232***	0.038***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.01)	(0.005)	(0.000)	(0.000)	(0.000)	(0.001)	(0.005)	(0.003)
FZISE	0.056***	−0.006	0.669***	−1.624***	4.006***	2.358***	0.079***	0.012***	1.148***	−1.13***	3.928***	0.795***
	(0.005)	(0.004)	(0.026)	(0.018)	(0.103)	(0.184)	(0.002)	(0.005)	(0.019)	(0.019)	(0.207)	(0.06)
Big4	0.117***	0.042***	0.215***	0.663***	1.332***	0.647**	0.087***	0.025***	0.853***	1.747***	0.421**	4.294***
	(0.003)	(0.003)	(0.034)	(0.02)	(0.266)	(0.256)	(0.004)	(0.005)	(0.033)	(0.015)	(0.21)	(0.074)
Listing status	−0.3***	−0.883***	9.275***	2.307***	10.983***	−4.954***	−0.31***	−0.811***	5.59***	2.22***	0.806**	−2.682***
	(0.004)	(0.004)	(0.118)	(0.032)	(0.265)	(0.328)	(0.004)	(0.011)	(0.04)	(0.027)	(0.382)	(0.283)
Observations	598	598	598	598	598	598	774	774	774	774	774	774

Note: Research variables are operationally defined in Table 1. Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

impacts on *TBQ*, whereas *ACEXP* demonstrates negative impacts across most quantiles, particularly on ROA, suggesting that AC expertise may not directly contribute to better financial outcomes, especially if not coupled with other effective governance mechanisms.

Control variables, such as *BSIZE*, *BMEET*, and *BGEND*, show varying effects across quantiles. *BSIZE* has a significant positive effect on *ROA*, while *BMEET* positively influences *ROE* and *TBQ* at higher quantiles. *BGEND* also shows a positive impact on financial outcomes, particularly *TBQ* at the 0.75 quantile. Additionally, *INSOWN* and *MNGOWN* have mixed effects on *ROA* and *TBQ*, suggesting that ownership structures may influence performance differently depending on the financial measure.

Collectively, the analysis shows that normative institutional pressures post-2018 play a significant role in strengthening the relationship between CSD and FP in Jordan. Firms that engage in sustainability reporting to meet societal and investor expectations benefit from enhanced financial outcomes, further solidifying the importance of CSD in CG and performance strategies.

4.3.2 | The Role of Coercive Pressures in Understanding the Moderating Impact of Audit Committee Function on the CSD–FP Link

The results from Table 7, utilizing Powell's (2022) PQR, reveal that the AC characteristics—AC size (*ACSIZE*), AC meetings (*ACMEET*), AC independence (*ACIND*), and AC expertise (*ACEXP*)—play a critical moderating role in the relationship between CSD and FP, measured by *TBQ*, *ROA*, and *ROE*, particularly in the context of the 2017 CG reforms in Jordan. These findings highlight the significance of coercive institutional pressures in shaping corporate behavior and governance practices.

The coefficient for *CSD* is significantly positive across all quantiles for each FP proxy, with a more pronounced effect post-CG reform. This indicates that the stronger regulatory environment following the reforms enhanced the impact of *CSD* on financial performance. For instance, *CSD*'s effect on *TBQ* rose from 0.34 at the 0.25 quantile to 0.693 at the 0.75 quantile ($p < 0.01$), while its impact on *ROA* increased from 21.624 to 41.894 at the 0.75 quantile ($p < 0.01$). These results align with previous studies (Ni et al. 2015; Xie et al. 2019), which suggest that sustainability disclosures driven by regulatory mandates enhance transparency, ultimately improving financial performance.

ACSIZE positively moderates the CSD–FP relationship across all quantiles, especially post-CG reforms. The interaction between *CSD* and *ACSIZE* for *ROE* increased from 15.525 at the 0.25 quantile to 28.767 at the 0.75 quantile ($p < 0.01$). This underscores the role of larger ACs, mandated by governance regulations, in enhancing the oversight of sustainability disclosures and boosting financial performance (Elmghaamez et al. 2024). However, *ACMEET* has a negative moderating effect on *ROA* and *ROE*, particularly at higher quantiles, with a value of −2.002 at the 0.25 quantile for *ROA* ($p < 0.01$), though

TABLE 7 | Conducting Powell's (2022) PQR to explore the impact of coercive pressure (2017 CG reforms) on how AC function moderates the CSD–FP nexus.

	The association between CSD and FP proxies *before* the CG reforms						The association between CSD and FP proxies *before* the 2017 CG reforms					
Model	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
Quantile	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**
Dependent	***TBQ***	***TBQ***	***ROA***	***ROA***	***ROE***	***ROE***	***TBQ***	***TBQ***	***ROA***	***ROA***	***ROE***	***ROE***
CSD	0.175	3.424***	11.065***	73.819***	52.932***	29.008***	0.34***	0.693***	21.624***	41.894***	22.658***	17.395***
	(0.14)	(0.039)	(0.613)	(1.114)	(18.918)	(1.905)	(0.123)	(0.058)	(1.555)	(0.766)	(2.031)	(2.847)
*CSD*ACSize*	0.078***	0.559***	1.258***	6.049***	3.741	23.119***	0.241***	0.167***	3.23***	2.055***	15.525***	28.767***
	(0.011)	(0.02)	(0.153)	(0.553)	(3.411)	(0.547)	(0.025)	(0.02)	(0.354)	(0.135)	(0.413)	(0.911)
*CSD*ACMeet*	−0.064***	−0.235***	−2.002***	−4.781***	−7.128***	−7.046***	0.044***	0.068***	2.925***	1.871***	2.666***	3.252***
	(0.019)	(0.002)	(0.054)	(0.14)	(0.26)	(0.406)	(0.008)	(0.005)	(0.089)	(0.05)	(0.179)	(0.197)
*CSD*ACIND*	0.491***	1.205***	0.998***	8.799***	2.844	18.065***	0.103**	0.788***	2.38***	2.155***	8.439***	2.756***
	(0.024)	(0.011)	(0.13)	(0.448)	(1.866)	(0.709)	(0.042)	(0.008)	(0.278)	(0.076)	(0.161)	(0.451)
*CSD*ACEXP*	−0.225***	−0.513***	−3.679***	−11.23***	−9.673***	−20.498***	−0.279***	−0.359***	−5.328***	−12.056***	−16.319***	−22.625***
	(0.014)	(0.005)	(0.041)	(0.353)	(1.003)	(0.855)	(0.024)	(0.01)	(0.321)	(0.112)	(0.131)	(0.94)
ACSIZE	0.004	0.142***	0.434***	0.169**	0.333	3.236***	0.025***	0.001***	0.414***	0.794***	2.42***	4.864***
	(0.005)	(0.004)	(0.02)	(0.083)	(0.34)	(0.093)	(0.004)	(0.004)	(0.099)	(0.04)	(0.089)	(0.176)
ACMEET	−0.012***	−0.034***	−0.198***	−0.593***	−0.609***	−0.808***	0.02***	0.002***	0.235***	0.238***	0.253***	0.54***
	(0.002)	(0.000)	(0.007)	(0.023)	(0.087)	(0.063)	(0.003)	(0.001)	(0.016)	(0.008)	(0.035)	(0.026)
ACIND	−0.079***	−0.18***	−0.296***	−1.129***	0.516**	−3.048***	−0.015*	−0.174***	0.433***	0.49***	−1.017***	−0.586***
	(0.007)	(0.002)	(0.019)	(0.028)	(0.218)	(0.155)	(0.008)	(0.001)	(0.071)	(0.01)	(0.039)	(0.064)
ACEXP	−0.004**	−0.013***	−0.577***	−1.793***	−1.529***	−2.435***	0.034***	0.028***	0.295***	1.333***	1.629***	2.857***
	(0.002)	(0.001)	(0.008)	(0.082)	(0.26)	(0.139)	(0.003)	(0.002)	(0.043)	(0.025)	(0.025)	(0.081)
B_SIZE	0.009***	−0.021***	0.354***	0.059***	0.435***	−0.008	−0.018***	−0.012***	0.319***	0.12***	0.381***	−0.037**
	(0.001)	(0.000)	(0.005)	(0.01)	(0.025)	(0.036)	(0.002)	(0.000)	(0.016)	(0.002)	(0.008)	(0.017)
BMEET	0.014***	0.039***	0.111***	0.177***	0.208***	0.65***	−0.005***	−0.001**	0.056***	0.228***	0.203***	0.38***
	(0.001)	(0.000)	(0.002)	(0.009)	(0.048)	(0.019)	(0.001)	(0.000)	(0.006)	(0.003)	(0.005)	(0.006)

(Continues)

TABLE 7 | (Continued)

	The association between CSD and FP proxies *before* the CG reforms						The association between CSD and FP proxies *before* the 2017 CG reforms					
Model	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
Quantile	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**
Dependent	***TBQ***	***TBQ***	***ROA***	***ROA***	***ROE***	***ROE***	***TBQ***	***TBQ***	***ROA***	***ROA***	***ROE***	***ROE***
BIND	−0.015***	0.000	0.116***	−0.033	−0.708***	0.67***	0.000	−0.006***	−0.262***	−0.05***	−0.191***	0.308***
	(0.001)	(0.000)	(0.009)	(0.02)	(0.081)	(0.051)	(0.002)	(0.000)	(0.021)	(0.007)	(0.01)	(0.047)
BGEND	0.019***	0.035***	0.325***	−0.201**	0.62***	0.226***	0.027***	0.014***	0.406***	0.389***	0.937***	0.364***
	(0.002)	(0.000)	(0.014)	(0.101)	(0.094)	(0.054)	(0.002)	(0.001)	(0.027)	(0.014)	(0.045)	(0.031)
CEOD	−0.067***	0.066***	−2.994***	−1.825***	−1.346***	−4.955***	0.056***	0.258***	1.421***	2.395***	4.209***	4.687***
	(0.004)	(0.001)	(0.023)	(0.117)	(0.229)	(0.271)	(0.005)	(0.004)	(0.114)	(0.047)	(0.076)	(0.239)
INSOWN	0.001***	0.000*	0.016***	0.013***	−0.043***	−0.026***	0.000***	0.001***	−0.013***	0.000	−0.039***	−0.006***
	(0.000)	(0.000)	(0.000)	(0.002)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
FROWN	0.002***	0.001***	−0.021***	−0.003	−0.047***	0.004	0.001***	0.001***	0.006***	0.018***	0.036***	0.029***
	(0.000)	(0.000)	(0.000)	(0.002)	(0.003)	(0.003)	(0.000)	(0.000)	(0.002)	(0.000)	(0.001)	(0.001)
MANOWN	0.009***	0.022***	0.163***	0.129***	0.111***	0.161***	−0.001***	0.02***	−0.025***	−0.059***	−0.012*	−0.007
	(0.000)	(0.000)	(0.001)	(0.002)	(0.017)	(0.012)	(0.000)	(0.000)	(0.005)	(0.002)	(0.007)	(0.006)
Leverage	0.002***	0.001***	−0.054***	−0.053***	−0.145***	−0.019***	0.003***	0.001***	−0.126***	−0.024***	−0.224***	0.004
	(0.000)	(0.000)	(0.000)	(0.002)	(0.005)	(0.003)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.002)
FSIZE	0.054***	0.015***	0.804***	−0.924***	4.539***	2.808***	0.075***	−0.001	1.36***	−0.656***	4.894***	1.082***
	(0.005)	(0.001)	(0.009)	(0.063)	(0.261)	(0.116)	(0.004)	(0.001)	(0.032)	(0.016)	(0.043)	(0.076)
Big4	0.087***	0.001	−0.211***	−0.354***	2.56***	0.708***	0.098***	0.042***	0.329***	1.494***	0.182***	4.415***
	(0.003)	(0.001)	(0.012)	(0.092)	(0.154)	(0.118)	(0.002)	(0.002)	(0.055)	(0.019)	(0.036)	(0.053)
Listing status	−0.213***	−0.894***	9.799***	1.732***	7.933***	−3.853***	−0.343***	−0.788***	6.489***	1.79***	3.236***	−1.282***
	(0.009)	(0.002)	(0.017)	(0.097)	(0.494)	(0.306)	(0.007)	(0.001)	(0.103)	(0.041)	(0.039)	(0.095)
Observations	409	409	409	409	409	409	963	963	963	963	963	963

Note: Research variables are operationally defined in Table 1. *Standard errors are in parentheses.* ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

it shows a slight positive effect on *TBQ* at the 0.75 quantile (0.068, $p < 0.01$). These mixed results suggest that although frequent meetings may provide opportunities for discussion, they may also introduce inefficiencies, detracting from performance (Kuzey et al. 2023).

The interaction between *CSD* and *ACIND* is generally positive for all FP proxies, particularly at higher quantiles. For instance, the *CSD*ACIND* interaction for *ROE* at the 0.75 quantile is 8.439 ($p < 0.01$). This indicates that independent ACs, as required by CG reforms, provide more effective governance and boost the credibility of sustainability disclosures, thereby enhancing financial performance (Ganda, 2018).

In contrast, *ACEXP* has a negative moderating effect across all FP proxies, particularly for ROA and ROE, with the *CSD*ACEXP* interaction for *ROA* at the 0.75 quantile being −12.056 ($p < 0.01$). This could indicate that although AC expertise is essential, it may lead to a focus on technical aspects at the expense of strategic governance, thus hindering broader financial improvements (Buallay et al. 2022).

The control variables also reveal interesting insights into the determinants of financial performance. Board size (*BSIZE*) positively impacts FP proxies, especially for *ROA* at the 0.25 quantile (0.319, $p < 0.01$), which aligns with previous research suggesting that larger boards provide better governance (Velte 2020). Similarly, board meetings (*BMEET*) have a consistently positive effect across FP proxies, with the strongest impact on *ROE* at the 0.75 quantile (0.65, $p < 0.01$), suggesting that more frequent meetings enhance decision-making and oversight. CEO duality (*CEOD*) shows mixed effects, negatively impacting *ROA* at the 0.25 quantile (−2.994, $p < 0.01$), but positively affecting *TBQ* at the 0.75 quantile (0.258, $p < 0.01$), indicating that although CEO duality may weaken operational performance, it could improve market perceptions of strong leadership.

The empirical findings reported in Tables 6 and 7 not only provide robust statistical evidence for the influence of CSD on financial performance but also align closely with the expectations of neo-institutional theory. Specifically, the significant improvement in firm performance post-2018 sustainability reporting guidelines illustrates the role of normative pressures, such as societal expectations and professional norms, in driving firms to adopt voluntary sustainability practices that enhance legitimacy and stakeholder trust (DiMaggio and Powell 1983; Suchman 1995). This is particularly evident in the rising financial returns observed among firms with higher CSD scores, reinforcing the view that normative isomorphism leads to improved market positioning and internal efficiency.

Moreover, the moderating effects of AC characteristics—especially size and independence—on the CSD–performance relationship underscore the influence of coercive institutional pressures, as imposed by the 2017 CG reforms. The positive interaction effects suggest that firms respond to regulatory mandates by strengthening governance structures, which in turn strengthen the financial benefits of sustainability disclosures. This regulatory compliance reflects coercive isomorphism, where formal rules push firms toward structurally conforming behaviors that enhance credibility and reduce agency conflicts (Meyer and Rowan 1977).

These findings collectively support the dual role of institutional pressures in shaping organizational behavior and financial outcomes. They confirm that in emerging markets like Jordan, where formal sustainability mandates are evolving, both normative encouragement and coercive enforcement are essential to foster meaningful ESG integration and governance reform.

4.4 | Additional Analysis

The results from Tables A1–A3 provide additional robustness checks and extend the findings presented in Tables 6 and 7 regarding the relationship between CSD and FP as well as the moderating role of AC characteristics.

Table A1 presents a full sample analysis of the CSD–FP relationship, including periods before and after the changes in sustainability reporting guidelines and CG reforms. In Table A1, the relationship between *CSD* and FP (measured by Tobin's *Q*, *ROA*, and *ROE*) is significant across multiple quantiles, which aligns with the baseline findings in Table 6. For Tobin's *Q*, the results show that *CSD* has a significant positive impact across the 0.25 (0.327, $p < 0.01$), 0.50 (0.462, $p < 0.01$), 0.75 (0.794, $p < 0.01$), and 0.95 (0.359, $p < 0.01$) quantiles, reinforcing the finding that *CSD* improves market-based performance measures. Similarly, for *ROA* and *ROE*, significant positive relationships are observed, particularly in the higher quantiles. For example, *ROA* shows a strong effect at the 0.75 quantile (15.555, $p < 0.01$) and 0.95 quantile (25.255, $p < 0.01$) while *ROE* follows a similar pattern with a significant impact at the 0.75 quantile (23.946, $p < 0.01$). These results are consistent with the findings in Table 6, which also demonstrated the significant positive influence of CSD on both accounting-based and market-based FP metrics before and after the 2018 sustainability reporting guidelines. The significance across different quantiles strengthens the robustness of these baseline findings, confirming that CSD positively impacts FP in firms of varying performance levels.

Likewise, Table A2 presents a full sample analysis of the link between CSD's categories and FP for the full sample, which includes periods before and after the changes in the sustainability reporting guidelines and CG reforms in Jordan. Table A2 disaggregates CSD into its main categories—economic (*ECD*), environmental (*ENVD*), and social (*SOD*)—and analyzes their impact on FP. The results show that all three categories positively affect FP, particularly at the 0.75 quantile, with significant results for each category. For example, ECD shows a significant positive impact on *ROA* (2.885, $p < 0.01$) and *ROE* (5.316, $p < 0.01$), while ENVD and SOD also show positive impacts on *ROA* and *ROE*. These results are consistent with the baseline findings in Table 6, which indicated that different aspects of sustainability reporting contribute to improved financial outcomes, with a stronger impact observed post-2018 guidelines. The detailed analysis of individual CSD categories in Table A2 provides further granularity to the original findings, reinforcing that each aspect of sustainability reporting contributes positively to FP.

Additionally, Table A3 represents a full sample analysis of the moderating role of AC characteristics. Specifically, Table A3 focuses on the moderating role of AC characteristics (*ACSize*, *ACMeet*, *ACInd*, and *ACExp*) on the relationship between CSD and FP. The results show that *ACSize* positively moderates the CSD–FP relationship across multiple quantiles. For instance, in the 0.75 quantile, the interaction between *CSD* and *ACSize* is significantly positive for *ROE* (25.647, $p < 0.01$), consistent with the findings in Table 7, where larger ACs were shown to enhance the effectiveness of sustainability disclosures, particularly after the 2017 CG reforms. However, the moderating effect of *ACMeet* is mixed, showing negative effects on *ROA* and *ROE* across quantiles, while slightly positive for Tobin's *Q* at higher quantiles (0.95 quantile: 0.095, $p < 0.01$). These results align with Table 7's findings that frequent meetings may not always lead to better financial outcomes, possibly due to inefficiencies. *ACInd* and *ACExp* display similar patterns to the baseline findings, where *ACInd* positively moderates the CSD–FP relationship, especially at higher quantiles (0.75 quantile for ROE: 3.286, $p < 0.01$), while *ACExp* generally has a negative moderating effect, suggesting that expertise alone may not enhance performance if not accompanied by strategic oversight.

4.5 | Endogeneity Checks

To ensure the robustness of the estimated relationship between CSD and FP, this study applies a two-stage PQR (2S-PQR) framework, consistent with recent methodological advancements in addressing endogeneity in sustainability–finance research (Bilyay-Erdogan et al. 2023; Heras et al. 2018). Endogeneity in this context arises from several sources, including reverse causality—where more profitable firms may be more inclined to disclose sustainability-related information—as well as from omitted variable bias and potential measurement error in self-reported disclosure indices (Cobb-Clark et al. 2016).

The adoption of the 2S-PQR model serves as a methodological contribution that aligns closely with the study's dual objectives: (i) assessing the heterogeneous impact of CSD on firm performance across different performance levels and (ii) addressing potential endogeneity concerns arising from reverse causality and omitted variable bias (Bilyay-Erdogan et al. 2023). Traditional techniques, such as the generalized method of moments (GMM) or the two-stage least squares (2SLS) models, estimate average effects and assume homogeneity across firms, which may obscure critical variations in the CSD–firm performance relationship. In contrast, the 2S-PQR approach captures the effects of CSD across the distribution of financial performance—providing a more comprehensive understanding of how CSD influences firms at the lower, median, and upper ends of performance outcomes (Powell 2022; Baum, 2013). This is particularly relevant in emerging markets like Jordan, where firm heterogeneity is pronounced due to differences in ownership structure, governance quality, and market exposure.

Moreover, the inclusion of a second stage using instrumental variables strengthens the causal inference by mitigating endogeneity, which is a common limitation in disclosure-performance studies (Heras et al. 2018). Compared with standard panel regressions, the 2S-PQR approach provides robust estimates that are resilient to outliers, heteroskedasticity, and distributional skewness (Bilyay-Erdogan et al. 2023), thereby offering a superior fit for testing the moderating role of AC characteristics across diverse firm types. This makes the method particularly well-suited to the study's theoretical framework and empirical objectives.

In this study, the two-stage quantile regression method begins with an IV regression to isolate the variation in the potentially endogenous variable, *CSD*, that is explained by exogenous instruments. This stage involves identifying suitable IVs that satisfy both relevance (strong correlation with *CSD*) and exogeneity (no direct correlation with the error term in the FP equation). The fitted value from this first-stage regression is then used as a regressor in the second-stage quantile model, allowing for the analysis of the effects of CSD across different quantiles of FP (Baione and Biancalana 2021). Unlike standard least squares regressions that estimate average effects, this method captures the heterogeneous impact of CSD on firms with different performance quantiles, offering a more robust evaluation.

Specifically, the selection of instruments in the current study is grounded in institutional theory and prior empirical literature. The industry-average CSD score is employed to reflect mimetic institutional pressures, as firms often emulate peer disclosure practices to enhance legitimacy (DiMaggio and Powell 1983; Farooq and De Villiers 2019). This variable influences CSD behavior but is plausibly exogenous to firm-level financial performance. Similarly, the lagged value of CSD accounts for disclosure inertia—past practices influencing current reporting—which is predictive of current CSD yet temporally removed from current financial outcomes, thus reducing the simultaneity bias (Gerged 2021). The third instrument, industry-level environmental intensity, measured through sector-wide environmental disclosure, captures broader normative and coercive pressures influencing firm-level disclosure decisions (Alhababsah 2022; Suchman 1995), but is not directly tied to the focal firm's financial performance. All instruments exhibit strong first-stage relevance, with *F*-statistics exceeding conventional thresholds, mitigating concerns over weak instruments.

In the first stage, a regression is conducted to generate the fitted value of the endogenous variable, *CSD*, which reflects the variations the instruments explain. In the second stage, the fitted value is used in a quantile regression to examine the effects across different quantiles of the dependent variable's distribution, such as financial performance metrics (e.g., *ROA*, *ROE*, and *TBQ*).

The results presented in Table 8 confirm the consistency of the main findings reported in Tables 6 and 7. Specifically, *CSD* continues to show significant positive effects across both lower (0.25) and upper (0.75) quantiles of the FP distribution, with particularly strong effects observed for *ROE*. Furthermore, the interaction terms between CSD and AC characteristics reveal nuanced moderating effects. For instance, audit committee size (*ACSize*) positively moderates the CSD–ROE relationship at the lower quantile, suggesting that larger committees are particularly effective in amplifying the financial benefits of sustainability disclosures in less well-performing firms. In contrast, audit committee meeting frequency (*ACMeet*) appears to exert

TABLE 8 | Two-stage panel quantile regression to address endogeneity concerns.

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Quantile	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**
	Without interaction	**Without interaction**	**Without interaction**	**Without interaction**	**Without interaction**	**Without interaction**	**With interaction**	**With interaction**	**With interaction**	**With interaction**	**With interaction**	**With interaction**
Dependent	***TBQ***	***TBQ***	***ROA***	***ROA***	***ROE***	***ROE***	***TBQ***	***TBQ***	***ROA***	***ROA***	***ROE***	***ROE***
fitted_CSD	0.007***	0.011***	0.131***	0.249***	0.606***	0.701***	0.011***	0.015***	0.305***	0.568***	1.366***	1.334***
	(0.001)	(0.003)	(0.026)	(0.024)	(0.048)	(0.042)	(0.002)	(0.005)	(0.043)	(0.034)	(0.043)	(0.04)
*CSD*ACSize*	—	—	—	—	—	—	0.317**	0.383	2.858	1.609	20.26***	19.044***
	—	—	—	—	—	—	(0.16)	(0.363)	(3.181)	(2.568)	(3.239)	(2.958)
*CSD*ACMeet*	—	—	—	—	—	—	−0.272***	−0.223	−4.956***	−9.525***	−24.23***	−23.029***
	—	—	—	—	—	—	(0.093)	(0.212)	(1.858)	(1.5)	(1.892)	(1.728)
*CSD*ACIND*	—	—	—	—	—	—	0.337*	0.109	7.642***	25.954***	58.173***	56.779***
	—	—	—	—	—	—	(0.18)	(0.411)	(3.596)	(2.903)	(3.661)	(3.343)
*CSD*ACEXP*	—	—	—	—	—	—	−0.204	−0.294	−8.179**	−9.093***	−29.494***	−29.492***
	—	—	—	—	—	—	(0.169)	(0.384)	(3.362)	(2.714)	(3.423)	(3.125)
B_SIZE	−0.02***	−0.017	0.119	−0.03	−0.348	−0.2	−0.018***	−0.024	0.063	−0.255**	−0.863***	−0.829***
	(0.006)	(0.015)	(0.118)	(0.108)	(0.217)	(0.19)	(0.006)	(0.015)	(0.129)	(0.104)	(0.131)	(0.12)
BMEET	−0.005	0.009	0.013	0.077	−0.181	−0.077	−0.008*	0.002	−0.036	−0.077	−0.429***	−0.4***
	(0.004)	(0.009)	(0.075)	(0.069)	(0.139)	(0.122)	(0.004)	(0.009)	(0.082)	(0.066)	(0.083)	(0.076)
BIND	0.006	−0.002	0.137	0.032	0.235	0.29	0.005	0.005	0.186	0.313**	0.856***	0.832***
	(0.008)	(0.02)	(0.157)	(0.143)	(0.29)	(0.254)	(0.008)	(0.019)	(0.169)	(0.136)	(0.172)	(0.157)
BGEND	0.009	−0.021	0.016	−0.252	−0.718	−1.244***	0.001	−0.045	−0.355	−1.173***	−2.389***	−2.381***
	(0.013)	(0.032)	(0.257)	(0.235)	(0.474)	(0.416)	(0.014)	(0.032)	(0.282)	(0.228)	(0.287)	(0.262)
ACSIZE	0.025	0.025	0.105	−0.185	−0.192	0.456	0.074**	0.12	0.445	1.245**	3.96***	4.15***
	(0.018)	(0.044)	(0.351)	(0.321)	(0.648)	(0.568)	(0.034)	(0.077)	(0.678)	(0.547)	(0.69)	(0.63)
ACMEET	0.017***	0.004	0.000	−0.125	0.174	0.206	−0.026*	−0.024	−0.675**	−1.219***	−2.992***	−2.807***
	(0.006)	(0.013)	(0.106)	(0.097)	(0.196)	(0.172)	(0.015)	(0.033)	(0.291)	(0.235)	(0.296)	(0.27)
ACIND	−0.028**	−0.086**	−0.129	−0.45*	−0.324	−0.881**	0.01	−0.111*	1.813***	2.402***	5.703***	5.426***
	(0.014)	(0.034)	(0.273)	(0.25)	(0.505)	(0.442)	(0.027)	(0.061)	(0.535)	(0.432)	(0.545)	(0.497)

(Continues)

TABLE 8 | (Continued)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Quantile	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**	**0.25**	**0.75**
	Without interaction	**Without interaction**	**Without interaction**	**Without interaction**	**Without interaction**	**Without interaction**	**With interaction**	**With interaction**	**With interaction**	**With interaction**	**With interaction**	**With interaction**
Dependent	***TBQ***	***TBQ***	***ROA***	***ROA***	***ROE***	***ROE***	***TBQ***	***TBQ***	***ROA***	***ROA***	***ROE***	***ROE***
ACEXP	−0.015	−0.009	−0.395*	−0.099	0.045	0.235	−0.04	−0.057	−1.197**	−1.035**	−3.269***	−3.271***
	(0.011)	(0.025)	(0.201)	(0.184)	(0.373)	(0.326)	(0.026)	(0.059)	(0.516)	(0.417)	(0.526)	(0.48)
CEOD	−0.018	0.035	−0.503	0.26	−1.56	−2.335	−0.05	0.039	−1.442	−1.29	−6.527***	−5.986***
	(0.047)	(0.111)	(0.888)	(0.813)	(1.642)	(1.439)	(0.05)	(0.113)	(0.992)	(0.801)	(1.01)	(0.923)
INSOWN	0.000	0.001	−0.008	−0.003	−0.023*	−0.012	0.000	0.001	−0.004	0.001	−0.005	−0.005
	(0.000)	(0.001)	(0.007)	(0.006)	(0.013)	(0.011)	(0.000)	(0.001)	(0.008)	(0.006)	(0.008)	(0.007)
FROWN	0.001**	0.000	0.006	0.016**	0.016	0.02	0.001**	0.000	0.000	0.008	0.009	0.013*
	(0.000)	(0.001)	(0.008)	(0.007)	(0.015)	(0.013)	(0.000)	(0.001)	(0.009)	(0.007)	(0.009)	(0.008)
MANOWN	0.002	0.022***	−0.008	−0.004	0.02	0.012	0.003**	0.023***	−0.023	−0.026	−0.029	−0.038
	(0.001)	(0.004)	(0.028)	(0.026)	(0.053)	(0.046)	(0.002)	(0.003)	(0.031)	(0.025)	(0.031)	(0.028)
FZISE	0.062***	−0.01	0.279	−0.95***	1.924***	−0.817	0.03	−0.055	−0.688	−3.203***	−3.708***	−3.733***
	(0.018)	(0.044)	(0.351)	(0.321)	(0.649)	(0.569)	(0.022)	(0.05)	(0.438)	(0.354)	(0.446)	(0.408)
Leverage	0.003***	0.000	−0.081***	−0.029***	−0.133***	0.051***	0.003***	0.001	−0.064***	0.001	0.05***	0.051***
	(0.001)	(0.001)	(0.011)	(0.01)	(0.021)	(0.019)	(0.001)	(0.001)	(0.013)	(0.01)	(0.013)	(0.012)
Big4	0.093***	0.039	0.802*	1.188***	0.668	3.011***	0.093***	0.032	0.88*	0.686*	1.111**	1.523***
	(0.024)	(0.057)	(0.46)	(0.421)	(0.851)	(0.745)	(0.025)	(0.057)	(0.495)	(0.4)	(0.504)	(0.46)
Listing status	−0.289***	−0.772***	8.251***	3.366***	6.224***	0.121	−0.246***	−0.751***	9.987***	4.888***	7.035***	6.536***
	(0.038)	(0.09)	(0.719)	(0.659)	(1.33)	(1.165)	(0.041)	(0.092)	(0.808)	(0.652)	(0.823)	(0.751)
_cons	0.481***	1.954***	−12.243***	7.9***	−18.16***	10.03***	0.705***	2.22***	−6.036**	20.623***	25.492***	25.135***
	(0.119)	(0.285)	(2.279)	(2.086)	(4.213)	(3.691)	(0.146)	(0.333)	(2.914)	(2.353)	(2.967)	(2.709)
Observations	1298	1298	1298	1298	1298	1298	1298	1298	1298	1298	1298	1298
Pseudo R^2	0.117	0.108	0.137	0.094	0.171	0.181	0.123	0.116	0.154	0.139	0.227	0.236

Note: Research variables are operationally defined in Table 1. Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

a negative moderating influence on *ROA* and *ROE*, implying that excessive meetings may introduce inefficiencies rather than enhance governance oversight (Kuzey et al. 2023). Independent audit committees (*ACInd*), on the other hand, significantly strengthen the *CSD–ROE* link, supporting the notion that independence enhances the credibility and impact of sustainability disclosures (Ganda, 2018). Conversely, audit committee expertise (*ACExp*) has a negative effect on both *ROA* and *ROE*, suggesting that a narrow focus on technical compliance may hinder broader strategic governance benefits.

Collectively, the use of the 2S-PQR model not only ensures the internal validity of the results by addressing endogeneity concerns but also provides a theoretically grounded and empirically rigorous evaluation of how AC structures and institutional pressures jointly shape the CSD–FP nexus in an emerging market context.

5 | Conclusion

This study investigates the impact of CSD on FP in Jordan, focusing on the period before and after the introduction of the 2018 voluntary sustainability reporting guidelines and the 2017 CG reforms. Using Powell's (2022) PQR, we explored how normative and coercive institutional pressures shape the CSD–FP relationship, considering the moderating effects of AC characteristics.

The key findings highlight the significant positive relationship between *CSD* and financial performance, measured by Tobin's Q (*TBQ*), return on assets (*ROA*), and return on equity (*ROE*), both before and after the 2018 sustainability guidelines. Post-2018, the influence of CSD on financial performance strengthened, suggesting that firms which embraced the voluntary guidelines were rewarded with improved financial outcomes. This indicates that societal expectations for ethical behavior, transparency, and alignment with global standards (e.g., GRI and SDGs) play a crucial role in driving corporate strategies and improving firm value.

Audit committee characteristics, particularly audit committee size (*ACSIZE*), positively moderate the CSD–FP relationship, especially post-reform, reflecting the importance of strong governance in ensuring the effectiveness of sustainability disclosures. However, the results also reveal mixed effects for audit committee meetings (*ACMEET*), which negatively affect *ROA* and *ROE* but show slight positive impacts on *TBQ*. This suggests that while frequent meetings may foster discussion, they could also introduce inefficiencies that diminish financial performance. Independence (*ACIND*) enhances the credibility of sustainability disclosures, improving financial outcomes, while audit committee expertise (*ACEXP*) appears to have a negative effect, particularly on accounting-based performance, possibly due to an overemphasis on technical compliance.

These findings offer several actionable implications for corporate managers, policymakers, and investors operating in emerging market contexts such as Jordan. First, corporate managers should recognize the need to balance governance mechanisms—especially AC characteristics such as size, independence, meeting frequency, and technical expertise. Although larger and more independent ACs can enhance sustainability oversight and financial performance, excessive meetings or overly technical approaches may introduce inefficiencies and divert attention from strategic sustainability integration. To optimize outcomes, firms should tailor governance structures to their organizational context, ensuring that ACs' function not merely as compliance bodies but as strategic partners in sustainability initiatives.

Second, policymakers and regulators may consider refining existing governance mandates by introducing differentiated requirements based on firm size, ownership structure, or industry sector. For example, targeted guidelines that promote independence and strategic expertise, rather than purely technical compliance, could enhance AC effectiveness. Moreover, incentivizing voluntary sustainability disclosures through tax benefits, preferential financing, or ESG-linked listing advantages could encourage broader corporate participation in sustainability efforts. Such measures would support the transition from symbolic compliance to substantive ESG integration across the corporate landscape.

Third, for investors and analysts, the results signal that firms with well-structured ACs and stronger sustainability disclosures tend to exhibit better financial performance. Investors in emerging markets can use this insight to evaluate firm-level governance quality and CSD practices as indicators of long-term value creation and risk mitigation. Integrating ESG disclosure quality and AC composition into investment decision-making processes could therefore enhance portfolio performance while supporting responsible investing goals. By translating these findings into practical strategies for different stakeholders, the study not only contributes to academic discourse but also offers clear, context-sensitive guidance for enhancing corporate transparency, governance, and performance in emerging market economies.

Despite its theoretical and empirical contributions, this study has several limitations that warrant acknowledgement and open avenues for future inquiry. First, the empirical analysis is confined to listed firms in Jordan, which, while offering valuable insights into a unique institutional setting marked by evolving governance reforms and sustainability regulation, inherently limits the generalizability of the findings. The results may not fully capture the dynamics of CSD in other emerging or developed economies with different legal, institutional, or cultural contexts. Future research could extend this work through cross-country comparative analyses, particularly among countries at varying stages of institutional development, to explore how AC effectiveness and institutional pressures interact across jurisdictions.

Second, while this study focuses on the moderating role of AC characteristics—including size, independence, expertise, and meeting frequency—other internal governance mechanisms may also play a critical role in shaping sustainability disclosure practices. For example, the presence of dedicated sustainability committees, the integration of ESG-related metrics into executive compensation structures, and ownership structures such as ownership concentration, family ownership, or foreign institutional ownership could influence firms' responses to

institutional pressures. Investigating these dimensions could provide a more nuanced and holistic understanding of governance drivers behind CSD and its financial implications.

Third, the study adopts a quantitative methodological approach using archival data, which, while robust in estimating general relationships and moderating effects, may not fully capture the underlying strategic motivations or firm-level dynamics driving sustainability disclosure decisions. Future studies could adopt qualitative or mixed-methods approaches, such as interviews with board members, AC participants, ESG officers, case studies, or focus group discussions, to complement and contextualize quantitative findings. These methods could uncover the interpretive and cultural logics that firms use when navigating normative and coercive institutional pressures.

Finally, although the two-stage PQR (2S-PQR) addresses endogeneity and accounts for heterogeneity across the performance distribution, it remains constrained by the availability and reliability of observable data. Future research could consider longitudinal designs with refined firm-level indicators or leverage natural experiments (e.g., regulatory changes or ESG mandates) to establish stronger causal inferences.

Ethics Statement

The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the author upon reasonable request.

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Appendix A

APPENDICES

TABLE A1 | Additional test: full sample analysis of the relationship between corporate sustainability disclosure and financial performance proxies.

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Quantile	**0.25**	**0.50**	**0.75**	**0.95**	**0.25**	**0.50**	**0.75**	**0.95**	**0.25**	**0.50**	**0.75**	**0.95**
Dependent	***TBQ***	***TBQ***	***TBQ***	***TBQ***	***ROA***	***ROA***	*ROA*	***ROA***	***ROE***	***ROE***	***ROE***	***ROE***
CSD	0.327***	0.462***	0.794***	0.359***	0.482	9.923***	15.555***	25.255***	0.077	17.937***	23.946***	13.331***
	(0.052)	(0.015)	(0.021)	(0.007)	(0.34)	(0.129)	(0.157)	(0.204)	(0.218)	(0.462)	(0.413)	(0.167)
ACSIZE	0.014***	0.015***	0.037***	0.061***	0.364***	0.015	0.57***	0.29***	0.168***	0.364***	0.936***	0.665***
	(0.001)	(0.003)	(0.002)	(0.001)	(0.021)	(0.014)	(0.009)	(0.037)	(0.016)	(0.021)	(0.032)	(0.009)
ACMEET	0.008***	−0.003***	−0.007***	−0.007***	−0.114***	−0.1***	−0.014***	0.117***	−0.242***	0.104***	−0.18***	−0.409***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.004)	(0.002)	(0.006)	(0.005)	(0.014)	(0.013)	(0.009)
ACIND	−0.002*	−0.036***	−0.067***	−0.098***	−0.113**	−0.306***	−0.074***	−0.407***	−0.543***	−0.405***	−0.543***	0.178***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.046)	(0.007)	(0.012)	(0.026)	(0.034)	(0.016)	(0.035)	(0.012)
ACEXP	−0.022***	−0.016***	−0.036***	0.014***	−0.569***	−0.281***	−0.373***	−0.125***	−0.723***	−0.316***	−0.625***	−1.375***
	(0.002)	(0.000)	(0.000)	(0.001)	(0.014)	(0.003)	(0.006)	(0.021)	(0.011)	(0.012)	(0.025)	(0.004)
B_SIZE	−0.005**	−0.007***	−0.022***	−0.13***	0.295***	0.025***	0.145***	0.449***	0.629***	0.102***	0.204***	1.574***
	(0.002)	(0.000)	(0.000)	(0.001)	(0.007)	(0.003)	(0.004)	(0.004)	(0.015)	(0.006)	(0.014)	(0.006)
BMEET	−0.001***	0.006***	−0.002***	0.058***	0.096***	0.06***	0.165***	1.017***	0.175***	0.175***	0.168***	1.859***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.004)	(0.002)	(0.002)	(0.003)	(0.004)	(0.008)	(0.013)	(0.004)
BIND	−0.005***	0.002***	−0.001***	−0.053***	−0.013	0.122***	0.014***	−0.411***	−0.48***	0.108***	0.277***	−1.075***
	(0.001)	(0.000)	(0.000)	(0.001)	(0.029)	(0.005)	(0.005)	(0.01)	(0.019)	(0.015)	(0.019)	(0.004)
BGEND	0.033***	0.017***	0.007***	0.02***	0.359***	0.192***	0.454***	0.094***	0.617***	0.312***	−0.304***	−0.852***
	(0.005)	(0.001)	(0.000)	(0.003)	(0.025)	(0.011)	(0.004)	(0.008)	(0.023)	(0.013)	(0.025)	(0.009)
CEOD	−0.011	−0.099***	0.11***	0.848***	0.884***	0.251***	1.523***	9.742***	0.777***	1.068***	1.648***	19.154***
	(0.017)	(0.005)	(0.006)	(0.004)	(0.234)	(0.037)	(0.022)	(0.049)	(0.141)	(0.238)	(0.103)	(0.039)
INSOWN	0.000***	0***	0.001***	0.003***	−0.006***	0.002***	0.002***	0.002***	−0.026***	−0.006***	−0.007***	−0.043***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)

(Continues)

TABLE A1 | (Continued)

Model	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
Quantile	**0.25**	**0.50**	**0.75**	**0.95**	**0.25**	**0.50**	**0.75**	**0.95**	**0.25**	**0.50**	**0.75**	**0.95**
Dependent	***TBQ***	***TBQ***	***TBQ***	***TBQ***	***ROA***	***ROA***	*ROA*	***ROA***	***ROE***	***ROE***	***ROE***	***ROE***
FROWN	0.001***	0.000***	0.000***	0.002***	0.003***	0.005***	0.017***	0.052***	0.014***	0.024***	0.03***	0.054***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)
MNGOWN	0.007***	0.01***	0.018***	0.054***	−0.01**	−0.013***	0.032***	0.235***	0.035***	0.021***	0.079***	0.168***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.002)	(0.001)
Leverage	0.003***	0.002***	0.000***	0.000*	−0.08***	−0.051***	−0.024***	−0.018***	−0.204***	−0.057***	0.077***	0.201***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)	(0.001)	(0.000)
FZISE	0.065***	0.009***	0.033***	−0.136***	0.935***	0.129***	−1.045***	−3.103***	3.658***	2.335***	1.34***	0.647***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.012)	(0.012)	(0.006)	(0.009)	(0.038)	(0.052)	(0.042)	(0.015)
Big4	0.119***	0.119***	0.054***	0.404***	0.626***	0.66***	1.266***	1.834***	1.283***	1.474***	4.187***	2.024***
	(0.003)	(0.002)	(0.003)	(0.003)	(0.014)	(0.009)	(0.016)	(0.021)	(0.024)	(0.053)	(0.044)	(0.009)
Listing status	−0.316***	−0.535***	−0.765***	−1.805***	7.595***	2.772***	1.777***	0.439***	6.142***	0.253***	−1.809***	−43.513***
	(0.008)	(0.004)	(0.002)	(0.002)	(0.052)	(0.035)	(0.016)	(0.036)	(0.079)	(0.067)	(0.105)	(0.021)
Observations	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372

Note: Research variables are operationally defined in Table 1. *Standard errors are in parentheses*. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

TABLE A2 | Additional test: full sample analysis of the relationship between the main categories of corporate sustainability disclosure and financial performance proxies.

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Quantile	**0.75**	**0.75**	**0.75**	**0.75**	**0.75**	**0.75**	**0.75**	**0.75**	**0.75**
Dependent	***TBQ***	***ROA***	***ROE***	***TBQ***	***ROA***	***ROE***	***TBQ***	***ROA***	***ROE***
ECD	0.243***	2.885***	5.316***	—	—	—	—	—	—
	(0.008)	(0.016)	(0.074)	—	—	—	—	—	—
ENVD	—	—	—	0.882***	16.495***	20.399***	—	—	—
	—	—	—	(0.014)	(0.537)	(0.435)	—	—	—
SOD	—	—	—	—	—	—	0.646***	13.102***	32.402***
	—	—	—	—	—	—	(0.007)	(0.067)	(0.365)
ACSIZE	0.018***	0.513***	1.096***	0.027***	0.469***	0.846***	0.035***	0.291***	0.818***
	(0.000)	(0.008)	(0.023)	(0.001)	(0.025)	(0.06)	(0.001)	(0.012)	(0.023)
ACMEET	0.001***	−0.089***	−0.239***	−0.004***	−0.153***	−0.074	−0.002***	−0.013**	−0.029***
	(0.000)	(0.003)	(0.006)	(0.000)	(0.028)	(0.074)	(0.000)	(0.006)	(0.006)
ACIND	−0.062***	−0.098***	−0.434***	−0.065***	0.302***	−0.595***	−0.063***	−0.262***	−0.046**
	(0.000)	(0.005)	(0.024)	(0.001)	(0.078)	(0.022)	(0.000)	(0.01)	(0.019)
ACEXP	−0.03***	−0.461***	−0.612***	−0.021***	0.02	−0.647***	−0.031***	−0.357***	−0.601***
	(0.001)	(0.003)	(0.019)	(0.001)	(0.025)	(0.016)	(0.000)	(0.003)	(0.017)
B_SIZE	−0.016***	0.119***	0.327***	−0.022***	0.078***	0.203***	−0.012***	0.102***	0.388***
	(0.000)	(0.004)	(0.01)	(0.001)	(0.014)	(0.028)	(0.000)	(0.004)	(0.006)
BMEET	0.004***	0.152***	0.37***	0.003***	0.135***	0.284***	0.005***	0.13***	0.103***
	(0.000)	(0.002)	(0.008)	(0.000)	(0.007)	(0.005)	(0.000)	(0.002)	(0.01)
BIND	0.000	−0.055***	0.162***	0.005***	0.044***	0.412***	−0.004***	0.075***	0.065***
	(0.000)	(0.003)	(0.01)	(0.001)	(0.01)	(0.016)	(0.000)	(0.006)	(0.015)
BGEND	0.008***	0.406***	0.155***	0.02***	0.276***	0.331***	0.012***	0.301***	0.153***
	(0.000)	(0.004)	(0.014)	(0.001)	(0.036)	(0.063)	(0.000)	(0.003)	(0.028)
CEOD	0.145***	1.517***	1.02***	0.092***	1.113***	1.432***	0.094***	0.665***	1.024***
	(0.002)	(0.007)	(0.061)	(0.004)	(0.036)	(0.156)	(0.002)	(0.023)	(0.08)
INSOWN	0.001***	−0.003***	−0.009***	0.001***	0.002***	−0.003	0.001***	0.003***	−0.016***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.003)	(0.000)	(0.000)	(0.000)
FROWN	0.000***	0.017***	0.032***	0.000***	0.008***	0.044***	0***	0.019***	0.026***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.002)	(0.001)	(0.000)	(0.000)	(0.000)
MNGOWN	0.018***	0.007***	0.076***	0.019***	0.024***	0.083***	0.018***	0.007***	0.013***
	(0.000)	(0.001)	(0.002)	(0.000)	(0.004)	(0.004)	(0.000)	(0.001)	(0.002)
Leverage	0.000***	−0.025***	0.041***	0**	−0.03***	0.048***	0.001***	−0.025***	0.07***
	(0.000)	(0.000)	(0.002)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.002)
FZISE	0.048***	−0.362***	1.859***	0.044***	−0.095	1.777***	−0.001	−1.014***	0.572***
	(0.001)	(0.007)	(0.027)	(0.001)	(0.07)	(0.047)	(0.001)	(0.004)	(0.023)
Big4	0.046***	1.213***	3.494***	0.027***	1.121***	4.084***	0.03***	0.981***	3.381***
	(0.001)	(0.012)	(0.017)	(0.002)	(0.047)	(0.09)	(0.001)	(0.009)	(0.039)
Listing status	−0.793***	1.837***	−2.508***	−0.764***	1.908***	−2.96***	−0.757***	1.621***	−2.162***
	(0.002)	(0.013)	(0.026)	(0.003)	(0.047)	(0.269)	(0.002)	(0.014)	(0.059)
Observations	1372	1372	1372	1372	1372	1372	1372	1372	1372

Note: Research variables are operationally defined in Table 1. The PQR analysis was conducted at 75%. Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

TABLE A3 | Additional test: full sample analysis of the moderating role of AC characteristics on the relationship between corporate sustainability disclosure and financial performance proxies.

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Quantile	0.25	0.50	0.75	0.95	0.25	0.50	0.75	0.95	0.25	0.50	0.75	0.95
Dependent	*TBQ*	*TBQ*	*TBQ*	*TBQ*	*ROA*	*ROA*	*ROA*	*ROA*	*ROE*	*ROE*	*ROE*	*ROE*
CSD	0.115***	0.626***	1.461***	7.305***	19.971***	26.775***	36.637***	21.235***	18.943***	0.287	5.43***	41.834***
	(0.036)	(0.008)	(0.012)	(0.041)	(2.544)	(0.253)	(0.936)	(0.266)	(0.795)	(0.942)	(2.058)	(4.357)
*CSD*ACSize*	0.174***	0.022***	0.377***	1.283***	1.542**	1.787***	2.038***	13.41***	16.508***	16.049***	25.647***	62.476***
	(0.013)	(0.002)	(0.004)	(0.012)	(0.733)	(0.108)	(0.243)	(0.07)	(0.161)	(0.256)	(0.503)	(1.234)
*CSD*ACMeet*	−0.001	−0.111***	−0.076***	0.095***	−2.185***	−2.774***	−2.518***	−3.348***	−3.945***	−2.914***	−6.316***	−12.452***
	(0.007)	(0.001)	(0.001)	(0.003)	(0.142)	(0.042)	(0.11)	(0.017)	(0.06)	(0.102)	(0.182)	(0.192)
*CSD*ACIND*	0.146***	0.373***	0.689***	1.661***	2.032***	0.04	1.19***	12.138***	5.176***	3.29***	3.286***	5.67***
	(0.008)	(0.002)	(0.002)	(0.006)	(0.42)	(0.032)	(0.136)	(0.034)	(0.166)	(0.155)	(0.21)	(0.513)
*CSD*ACEXP*	−0.25***	−0.265***	−0.189***	−0.414***	−3.953***	−5.695***	−10.112***	−6.638***	−14.576***	−20.307***	−26.229***	−52.556***
	(0.007)	(0.001)	(0.002)	(0.002)	(0.159)	(0.052)	(0.129)	(0.018)	(0.131)	(0.212)	(0.231)	(0.226)
ACSIZE	−0.001***	0.004***	0.093***	−0.163***	−0.085	−0.37***	−0.65***	−2.249***	−2.723***	−2.948***	−4.79***	−8.014***
	(0.002)	(0.000)	(0.001)	(0.002)	(0.178)	(0.018)	(0.053)	(0.014)	(0.039)	(0.052)	(0.102)	(0.221)
ACMEET	0.007***	0.023***	0.016***	−0.005***	0.245***	0.31***	0.282***	0.322***	0.325***	0.442***	1.029***	2.059***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.017)	(0.007)	(0.017)	(0.003)	(0.01)	(0.02)	(0.031)	(0.047)
ACIND	−0.022***	−0.077***	−0.154***	−0.421***	0.408***	−0.36***	−0.287***	2.288***	−0.274***	−0.549***	−0.244***	1.352***
	(0.001)	(0.000)	(0.000)	(0.001)	(0.04)	(0.006)	(0.022)	(0.005)	(0.03)	(0.023)	(0.042)	(0.106)
ACEXP	0.015***	0.028***	0.001***	0.058***	0.247***	0.68***	1.214***	0.644***	1.669***	2.446***	3.259***	5.142***
	(0.001)	(0.000)	(0.000)	(0.001)	(0.038)	(0.012)	(0.023)	(0.004)	(0.023)	(0.03)	(0.057)	(0.069)
B_SIZE	−0.014***	−0.008***	−0.01***	−0.131***	0.265***	0.022***	0.119***	0.414***	0.449***	−0.123***	0.275***	1.49***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.022)	(0.001)	(0.007)	(0.001)	(0.004)	(0.008)	(0.01)	(0.021)
BMEET	−0.002***	0.008***	0.002***	0.069***	0.051***	0.098***	0.141***	1.081***	0.184***	0.138***	0.485***	1.433***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.01)	(0.002)	(0.003)	(0.001)	(0.005)	(0.005)	(0.008)	(0.019)
BIND	−0.008***	−0.002***	−0.01***	−0.029***	−0.117***	0.151***	0.112***	−0.598***	−0.297***	0.256***	0.042***	−0.679***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.027)	(0.005)	(0.011)	(0.003)	(0.01)	(0.008)	(0.016)	(0.03)
BGEND	0.036***	0.012***	0.002***	0.049***	0.461***	0.21***	0.114***	−0.415***	0.672***	0.292***	0.108***	−1.263***
	(0.002)	(0.000)	(0.000)	(0.001)	(0.014)	(0.004)	(0.015)	(0.004)	(0.008)	(0.019)	(0.028)	(0.077)

(Continues)

TABLE A3 | (Continued)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
CEOD	0.024***	−0.035***	0.068***	1.001***	0.097	0.518***	1.094***	8.756***	1.236***	1.713***	2.835***	17.81***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.111)	(0.01)	(0.026)	(0.015)	(0.087)	(0.041)	(0.105)	(0.201)
INSOWN	0.000***	0.000***	0.000***	0.004***	−0.005***	0.000***	−0.001***	−0.021***	−0.026***	−0.011***	−0.004***	−0.048***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
FROWN	0.001***	0.001***	0.000***	0.002***	−0.002**	0.005***	0.015***	0.05***	0.008***	0.016***	0.032***	0.039***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.005)
MANOWN	0.005***	0.009***	0.019***	0.042***	0.008***	−0.018***	0.044***	0.237***	0.027***	0.007***	0.069***	0.037***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)	(0.001)	(0.000)	(0.002)	(0.002)	(0.004)	(0.006)
Leverage	0.002***	0.001***	0.000***	−0.001***	−0.099***	−0.062***	−0.031***	−0.015***	−0.211***	−0.066***	0.021***	0.141***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)	(0.005)
FSIZE	0.092***	0.038***	−0.005***	−0.158***	1.038***	0.345***	−0.458***	−1.724***	4.632***	3.38***	1.79***	3.057***
	(0.003)	(0.000)	(0.000)	(0.000)	(0.007)	(0.007)	(0.019)	(0.003)	(0.013)	(0.037)	(0.036)	(0.042)
Big4	0.107***	0.09***	0.021***	0.366***	0.475***	0.474***	0.945***	2.268***	0.458***	1.625***	3.433***	1.124***
	(0.001)	(0.001)	(0.000)	(0.001)	(0.062)	(0.012)	(0.031)	(0.005)	(0.04)	(0.022)	(0.041)	(0.061)
Listing status	−0.308***	−0.573***	−0.783***	−1.782***	7.42***	2.532***	1.323***	−0.003	4.958***	−0.313***	−2.098***	−39.132***
	(0.003)	(0.000)	(0.000)	(0.001)	(0.03)	(0.011)	(0.079)	(0.005)	(0.048)	(0.034)	(0.062)	(0.159)
Observations	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372	1372

Note: Research variables are operationally defined in Table 1. The PQR analysis was conducted at 75%. Standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.