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Political connections and earnings opacity: the role of integrated reporting quality

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Abstract

Purpose This paper empirically investigates the ability of integrated reporting quality (IRQ) to mitigate earnings opacity (EO) in politically connected firms and improve financial transparency. It also examines how IRQ moderates the relationship between political connections (PC) and EO among firms listed on the Egyptian Stock Exchange (EGX).

Design/methodology/approach A panel of 200 firm-year observations is examined over the period 2019–2023, comprising a final sample of 40 non-financial companies listed on the EGX. Multiple regression analyses are conducted. Earnings management serves as a proxy for EO, and IRQ scores are derived from companies' integrated reports, based on the integrated reporting (IR) index developed by ElDeeb (J Account Res 3(2):1–33, 2019). Data on PC are collected from corporate governance reports and publicly available biographies of board members.

Findings The findings reveal a positive relationship between PC and EO; however, the introduction of the moderating effect of IRQ significantly weakens this relationship. The results support the notion that IR, by providing a holistic overview of a firm's financial and non-financial performance, can alleviate the adverse effects of PC on the quality and transparency of financial reporting.

Originality/value The findings of this paper are highly relevant to various stakeholders. For policymakers, the results can support regulation-enabling guidelines that promote transparency in firm disclosure and eradicate adverse impacts of political influence on earnings concealment. For firms, adopting high-quality IR practices enhances investor confidence and ensures the persistence of long-term performance. For investors and financial analysts, the research offers valuable insights that facilitate a more informed evaluation of the risks associated with political linkage and EO.

Keywords Political connection, Integrated reporting quality, Earnings opacity, Financial reporting, Transparency, Information asymmetry

Introduction

Over the last few years, growing attention to corporate accountability and transparency has raised concerns about the need to address earnings opacity (EO)[1] among firms, particularly those that are politically connected. On the one hand, political connection (PC), while often seen as beneficial for securing resources, government contracts, or better regulatory treatment, has also been linked to negative effects like reduced financial transparency and higher EO [52], where managers can utilize such connections to hide poor performance. This is the double-edged sword of PC, where rewards are gained at the expense of transparency and accountability. On the other hand, EO can conceal a firm's true financial position, undermine investor confidence, and increase systemic risk in financial markets [45].

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[1] This research uses earnings management as a proxy for earnings opacity; therefore, these terms are used interchangeably.

Previous research on the effects of PC on business financial practices has yielded mixed results. For instance, Riahi-Belkaoui [68] and Hashmi et al. [53] affirm that politically connected companies are likely to engage in earnings manipulation and EO, which diminishes the credibility of accounting reports. Firms exposed to high political risk are more likely to exhibit higher levels of EO [57]. Gupta et al. [52] recently demonstrated that the maximum level of EO is associated with politically connected companies. Studies like these illustrate the complex and often fragile nature of PC in corporate financial contexts. Systems capable of counteracting the negative consequences of such relationships have been researched, but to a limited extent.

The current literature predominantly concentrates on PC, and EO drivers, often overlooking the potential role of IRQ in enhancing transparency and accountability. Integrated reporting (IR) combines financial and non-financial data to provide a holistic view of a company's value creation and performance and thus has become a viable approach to mitigate EO. Camilleri [22] and Sun et al. [77] recognize that IR makes firms' financial reports less shareholder-oriented and more focussed on sustainability and transparency. Moreover, Lee and Yeo [63] and Bonareri et al. [15] assert that firms practising IR are regarded as possessing greater credibility and reliability, thus alleviating concerns about secrecy. Therefore, adopting high-quality IR practices encourages firms to disclose relevant, comprehensive, and interactive information, potentially diminishing PC's negative impact on financial transparency. Despite the increasing focus on IR, its role in moderating the relationship between PC and EO has not been examined yet,thus, this research seeks to address that gap.

The primary objective of the current study is to investigate how IRQ can alleviate EO among politically connected companies, specifically in an emerging market like Egypt. Due to its poor institutional mechanisms and feeble regulatory enforcement tools [41], PC tend to create information asymmetry and lower financial transparency [23, 24]. This study examines whether IRQ has the potential to act as a governance tool for greater corporate accountability and reduced earnings manipulation. Hence, in striving to accomplish this mission, the study addresses three research questions of fundamental nature: (1) Is PC positively correlated with EO? (2) Does IRQ generate lower EO levels? and (3) Does IRQ moderate the effect of PC on EO and alleviate the adverse effect of PC on financial transparency?

The rationale for selecting Egypt lies in its distinctive institutional and political landscape that positions PC at the centre of corporate governance and financial disclosure practices. Egypt is a frontier market characterized by poorly established formal frameworks and lenient compliance regulations, which highlights EO and exacerbates information asymmetry between stakeholders and firms [41]. The presence of firms with PC in Egypt and their potential bias towards receiving state contracts or regulatory support creates a compelling context to analyse how such connections influence the disclosure of financial information [59]. Additionally, Egypt has been undertaking gradual reforms in corporate disclosure policies, such as promoting IR, making it a valuable case to examine the extent to which successful IR can mitigate the negative effects of PCs on EO [42]. This setting not only enriches existing literature but also offers practical insights for policymakers and regulators in other emerging economies seeking to enhance corporate accountability and transparency.

The present study offers several contributions to enrich the literature on the role of IRQ in fostering accountability within PC firms. First, despite the growing emphasis on IRQ, its effect on moderating the relationship between PC and EO remains largely unexplored. To the researchers' knowledge, this research is the first attempt to investigate this effect. Second, as a groundbreaking approach to corporate disclosure, IR has gained momentum worldwide; nevertheless, its potential has yet to be fully explored in the context of emerging markets, such as Egypt. Third, this paper makes a significant contribution to practice where PC is a key determinant of firm conduct, by highlighting its negative consequences and emphasizing the importance of BOD independence as a corporate governance mechanism. Fourth, it provides insightful findings that support the agency theory by mitigating agency problems stemming from information asymmetry between insiders and other stakeholders, particularly due to PC. Finally, for standards setters, the findings of this research align with the International Integrated Reporting Council (IIRC) framework, which improves accounting information quality by promoting better IR disclosures in politically connected firms.

The remainder of this paper is organized as follows. The next section presents the background of this research, highlighting the role of IR, followed by the literature review and hypothesis development. Subsequently, the research design and empirical analysis are discussed. Thereafter, empirical results and implications

are presented, leading to our conclusion, research limitations, and future research recommendations.

Background

IR emerged as a holistic corporate reporting approach that combines financial and non-financial aspects of the business [69]. It started as an idea initiated by a meeting hosted by the Prince of Wales at St James's Palace in 2009 in response to the global financial crisis.[2] This meeting called for an international organization responsible for creating a global IR framework [38], to promote accountability and transparency [6]. As a result, in 2010, the IIRC was established as a consortium of various interested parties in corporate reporting, such as investors, standard-setters, non-governmental organizations, regulators, and academics. This alliance shared a vision that the next stage in corporate reporting development should focus on disseminating information about firms' value preservation, creation or deterioration.[3] IIRC published its first international IR framework in 2013. According to this framework, IR is a unified report that includes financial, governance, economic, and social information. Hence, it helps investors make informed decisions by providing a comprehensive view of firms' value creation process (IIRC 2013). In 2021, the IIRC updated the 2013 original framework to improve its decision usefulness, with the last version to be applied commencing January 2022.

Literature review and hypotheses development

Political connection and earnings opacity

Firms seeking benefits from PC may have former or current politicians, government officials, or senior military members on their boards [25, 61]. Relationships with politicians can take various forms, such as friendships and funding campaigns [14, 26, 46]. Companies and politicians establish PC to serve both parties—the former aiming to acquire valuable key resources and secure profitable contracts while managing external uncertainties, and the latter seeking to achieve their political agendas [5, 84]. Additionally, such connections can lead to extra benefits like tax discounts, market power, favourable regulatory conditions, and government subsidies, especially during economic distress periods [13, 18, 46]. However, Bliss and Gul [14] reveal that PC firms are inefficient due to the protection secured by their connections. In the same vein, Chaney et al. [23] justify that PC firms disclose lower levels of accounting information quality, as they are less concerned with market pressures and devote less effort to depict their accrual properly because their PC shields them from penalties resulting from low-quality accounting information. Furthermore, PC motivates managers towards selective disclosures and EO [71, 82].

EO, which is when a company's financial reports conceal its true economic performance [55], has been a prominent topic in recent accounting literature because of its effects on market efficiency and investor trust. It indicates how well earnings numbers depict firms' true economic performance [12]. Stakeholders rely on earnings information to make better decisions by assessing and forecasting a company's future prospects. Consequently, earnings are crucial to the presentation of financial statements [71]. Bona-Sánchez et al. [16] find that earnings informativeness is less pronounced in firms with PC. As they seek to shield their PC from the public and keep competitive advantages from flowing to rivals, politicians, and shareholders are motivated to give the market as little information as possible. Moreover, firms with PC exhibit lower levels of earnings quality than firms with no PC, which is consistent with agency theory [5, 53].

According to Watts and Zimmerman [82], in the context of conflicting interests and management opportunism, agency theory states that conflicts will occur between principals (owners) and agents (managers). This conflict arises when managers pursue their personal interests at the expense of owners, resulting in agency costs. Shleifer and Vishny [74] state that firms with PC have higher agency costs. As Faccio [47] points out PC negatively affects firms' accounting and internal control systems. Additionally, Abuhijleh and Zaid [2] state that PC influences firms' strategic decisions and is linked to agency problems. Moreover, a review conducted by Hossain et al. [56] demonstrates the substantial impact of political costs on EO and financial transparency. Furthermore, Chen et al. [24] and Chaney et al. [23] document that lower earnings quality and analysts' accuracy levels lead to high levels of information asymmetry in PC firms. Hence, Riahi-Belkaoui [68] reveal that the higher the PC, the higher the EO. Based on the prior discussion, the first hypothesis is formulated, where firms with PC are more likely to engage in EO that obscure true financial performance, as follows:

H1. Firm political connectedness is positively associated with earnings opacity.

[2] Available at: https://integratedreporting.ifrs.org/10-years/10-years-summary/. Accessed March 26th, 2025.

[3] Available at: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://integratedreporting.ifrs.org/wp-content/uploads/2024/08/IntegratedReporting_Framework_061024.pdf. Accessed April 4th, 2025.

Integrated reporting quality and earnings opacity

IR offers a comprehensive view of a company's financial and non-financial aspects including governance, environmental, and social information in a single report [66, 80]. Therefore, IR is a new tool that enhances transparency and improves the quality of corporate reporting [22, 77]. As a result, it helps stakeholders better evaluate long-term organizational sustainability, value creation, and the efficient deployment of limited resources [66, 81]. According to [83] findings, companies provide additional information through voluntary disclosures, enabling stakeholders to justify the apparent discrepancy between assets' book and market values. This aligns with both stakeholder and signalling theories. Baboukardos and Rimmel [7] have found that the compulsory adoption of IR increases the usefulness of financial reporting for various stakeholders, supporting stakeholder theory. According to signalling theory, Baiman and Verrecchia [8] state that firms can mitigate information asymmetry by communicating with the market through disclosures. In line with Cotter et al. [27], it is suggested that signalling comprehensive, high-quality information to interested parties can address the issue of information asymmetry. According to Donkor et al. [37], IRQ can tackle information asymmetry by disseminating a comprehensive view of the company's performance, both financial and non-financial, thus supporting signalling theory. Along similar lines, Lee and Yeo [63] and Bonareri et al. [15] assert that IR reduces information asymmetry, which in turn improves earnings quality. In summary, a significant portion of existing literature supports the view that higher IRQ correlates with lower firm engagement in EO (e.g. [36, 44, 85]). Accordingly, the second hypothesis is formulated, suggesting that increased IRQ will reduce earnings manipulation and improve financial transparency, as follows:

H2. Integrated reporting quality is negatively associated with earnings opacity.

Political connection, integrated reporting quality, and earnings opacity

Institutional theory is a valuable approach in explaining business behaviour, especially in emerging markets like Egypt, where institutional voids and ineffective regulation enforcement significantly impact organizational behaviour [41]. While agency theory focuses on principal-agent disputes and information asymmetry, institutional theory highlights how businesses comply with external forces from regulators, sector conventions, and society to gain legitimacy [35]. In the Egyptian setting, institutions tend to be weak or ineffectively enforced, and companies are tempted to use informal arrangements, such as PC, to cope with uncertainty and gain access to resources [59]. Faccio [47] argues that firms can benefit from being politically connected in several forms, such as easier access to the credit market, stronger market power, lower taxes, and levels of default even with high leverage, nevertheless, they exhibit lower levels of performance. Accordingly, several problems, including corruption, deteriorating levels of financial performance, and financial reporting quality, are encountered by politically connected firms [23, 45, 47].

Prior studies document that firms' financial reporting content and quality are affected by their political connectedness. In terms of conservatism, Ball et al. [10] show that firms in countries exhibiting higher levels of political influence have less timely and conservative financial reporting. Also, Bushman and Piotroski [20] find that the market perceives earnings of firms operating in economies with high state involvement as less conservative. Furthermore, in terms of transparency, governmentally connected firms exhibit lower levels of transparency with their reporting [64]. This is in line with the findings of Riahi-Belkaoui [68], which reveal that firms with PC have higher thresholds of EO than their non-PC counterparts. Furthermore, having CEOs with PC results in lower sales and earnings growth, besides poorer stock returns. This is due to the lack of professionalism as these CEOs are more inclined to formulate boards dominated by government officials [45]. The reason behind the inferior reporting quality of PC firms is agency conflict [5, 67]. Prior research demonstrates that IR enhances transparency and mitigates information asymmetry, which increases earnings quality and improves the quality of corporate reporting, resulting in better firm valuation [15, 22, 63, 77]. With the integration of agency theory and institutional theory, this research points out the combined impact of internal governance mechanisms and institutional constraints at a wider level, to present a stronger account of the way in which IR can be used as a device for legitimacy-seeking in institutional weakness settings [51]. As IR can provide insightful information that lessens agency problems, it is expected that IR can mitigate the positive effect of PC on EO. Based on the prior discussion, the following hypothesis is conjectured, where the moderating effect of IRQ on the relationship between PC and EO diminishes at higher levels of IRQ, suggesting a nonlinear (diminishing returns) effect, as follows:

H3. Integrated reporting quality attenuates the positive association between firm political connectedness and earnings opacity.

Methodology

Sample selection and data collection

This research examines the IRQ as a moderator of the PC and EO relationship in an emerging market context like

Egypt. The initial sample consisted of all 70 firms listed on EGX. Banks and financial institutions have been omitted to attain consistency and unbiased industry-specificity since they are subject to different regimes and reporting standards. This exclusion resulted in a final sample of 40 non-financial firms listed on EGX over 2019–2023, yielding 200 firm-year observations, thereby having an equilibrium panel data set to investigate. The sample period begins in 2019 since standard and regular IR data were present in Egypt, as per ElDeeb [42] and Ismail et al. [59], official IR promotion started between 2017 and 2018 through institutional reforms and stakeholder outreach. Hence, data prior to 2019 are inadequate for assessing IRQ. This period provides a room for vital examination of IRQ's function in facilitating earnings transparency by politically connected firms during the peak of transparency reform in Egypt.

Various sources are employed to obtain data for reliability and completeness. Accounting data, including accruals, operating cash flows, revenue, and property, plant, and equipment (PPE), are obtained from firms' annual reports and the EGX database. PC data are extracted from corporate governance reports and publicly available biographies of board members. IRQ scores are developed using content analysis, which are then assessed based on the IR index developed by ElDeeb [42]. EO has been quantified using the adjusted Jones model [32], as described by Sharawi [73].

Measurements of variables

Earnings opacity

EO, the dependent variable, is captured using the Dechow et al. [31] adjusted Jones model following previous research (e.g. [53, 73]), whereby the absolute value of discretionary accruals (DA) of this model serves as an estimate of EO. DA, according to the adjusted Jones model, represent the manipulable portion of a firm's total accruals. Therefore, large absolute DA convey greater EO, since they represent more aggressive EO [32] and less transparent financial reporting. First, total accruals are calculated as depicted in the following equation:

$$TA_{it} = NI_{it} - OCF_{it} \tag{1}$$

where TA is the total accruals; NI is the annual net income; OCF is the operating cash flow; (*i*) stands for the firm; and (*t*) stands for the year.

Following, non-discretionary accruals (NDA) are calculated as the portion of total accruals that are considered "normal" or expected, based on the company's operating environment:

$$NDA_{it} = \beta_1(A_{it-1}) + \beta_2(\Delta REV_{it-1} - \Delta REC_{it-1}/A_{it-1}) + \beta_3(PPE_{it-1}/A_{it-1}) \tag{2}$$

where A_{it-1} is the ending total assets; ΔREV_{it-1} is the change in revenue; ΔREC_{it-1} is the change in accounts receivable; PPE_{it-1} is the total property, plant, and equipment; β_1, β_2, β_3 are coefficients estimated from the regression model; (*i*) stands for the firm; and (*t*) stands for the year.

Finally, DAs are obtained as the difference between total accruals and non-discretionary accruals:

$$DA_{it} = TA_{it} - NDA_{it} \tag{3}$$

where TA is the total accruals; NDA is the non-discretionary accruals; (*i*) stands for the firm; and (*t*) stands for the year.

Firms with a high absolute value of DA are considered opaque, while firms with low absolute value of DA are considered more transparent.

Political connections

PC is proxied using a dummy variable, following Ismail et al. [59]. A value of 1 is assigned if the board of directors includes at least one politically connected member (e.g. a current or former government official or politician), and 0 otherwise.

Integrated reporting quality

IRQ is measured by ElDeeb [42] IR index. The index determines the level to which corporations are complying with the IR principles of connectivity, strategic focus, and materiality. The index contains 7 basic categories of organizational overview, opportunities and risks, strategy and resource deployment, business model, governance, performance, and outlook, which are further divided into 40 sub-elements as can be seen in Appendix A. The scores were standardized from 0 to 10 in a way that improved reporting quality scores.

To ensure validity and reliability in content analysis, two independent coders examined the merged reports according to ElDeeb's [42] index. Double coding facilitated the reduction of individual coder bias and enhanced the robustness of the data collection process. Apart from that, intercoder reliability was also examined using Cohen's kappa statistic, which provided evidence of strong agreement among the coders (kappa = 0.87), resulting in significant consistency when interpreting and using the IRQ index across the sampled companies. The strict validation procedure guarantees objectivity and replicability of the IRQ measure, providing assurance of the integrity of the IRQ scores computed for the research.

Control variables

This research employs firm-level control variables with their theoretical foundations in dominant theories and earlier empirical research to control for confounding. The controls are chosen for their applicability to EO and financial reporting practice to enhance identification robustness of PC and IRQ effects.

Firm size (FS) is the natural logarithm of total assets [72]. Signalling theory contends that the large firms are more closely examined by the investors, regulators, and analysts because they are conspicuous and of a systemic nature and that this would cause them to be more transparent [62]. The big firms, hence, ought to be less opaque in earnings versus the small firms.

Leverage (LEV) is defined as total debt divided by total assets [65]. By agency theory, highly leveraged companies can manage earnings to meet debt covenants to prevent defaulting on penalties [32]. But creditor monitoring may also serve as an external governance mechanism that constrains managerial flexibility, especially in settings where firms are highly dependent on raising funds [41]. LEV is therefore brought in to both reflect the pressure to exploit earnings and encompass the possible mitigating effect of external monitoring.

Return on equity (ROE) is the net income scaled by total equity [39] and captures firm profitability. Positive accounting theory posits that profitable companies may engage in earnings smoothing to provide stable performance to stakeholders [21]. This behaviour biases underlying financial performance and supports EO, and therefore, ROE is a suitable control variable for analysis.

Audit quality (AQ) is a dummy variable that equals 1 if the auditor of the firm is a Big 4 auditor, and 0 otherwise [59]. As per stakeholder theory and agency theory, more effective auditors are likely to improve financial reporting credibility through a decrease in information asymmetry between managers and outsiders [30, 49]. Hence, companies audited by Big 4 audit firms are expected to disclose more detailed financial accounts and offer fewer EO. These control variables are included to isolate the effect of PC and IRQ on EO by controlling for established determinants of financial reporting practice.

Empirical model

To test hypothesis (1) on the association between PC and EO and hypothesis (2) on the association between IRQ and EO, the following regression model is employed:

$$\begin{aligned} EO_{it} = {} & \beta_0 + \beta_1 PC_{it} + \beta_2 IRQ_{it} + \beta_3 FS_{it} \\ & + \beta_4 ROE_{it} + \beta_5 AQ_{it} + \beta_6 LEV_{it} + \in_{it} \end{aligned} \quad (4)$$

where EO_{it} represents the dependent variable that proxies for earnings opacity; PC_{it} denotes political connections which is a dummy variable that equals 1 if the board of directors includes at least one politically connected member (e.g. a current or former government official or politician), and 0 otherwise; IRQ_{it} is the integrated reporting quality score; FS_{it} is firm size measured as the natural logarithm of total assets; ROE_{it} is the return on equity measured as the ratio of net income to total equity; AQ_{it} is the audit quality which is a dummy variable that equals 1 if the firm's auditor is a Big 4 firm, and 0 otherwise; LEV_{it} denotes the leverage calculated as the ratio of total debt to total assets; (*i*) stands for the firm; and (*t*) stands for the year.

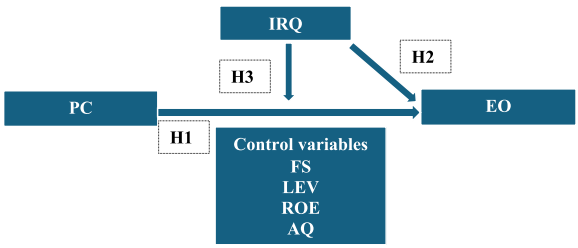

Fig. 1 Research framework: integrated reporting quality's moderating role on the relationship between political connections and earnings opacity

Table 1 Descriptive statistics

	N	Minimum	Maximum	Mean	Std. deviation
PC_{it}	200	0	1	0.440	0.498
IRQ_{it}	200	0.220	0.850	0.300	0.180
EO_{it}	200	−177.250	82.020	−0.056	18.240
FS_{it}	200	7.975	11.305	9.652	0.765
ROE_{it}	200	−0.712	3.088	0.085	0.315
AQ_{it}	200	0	1	0.540	0.500
LEV_{it}	200	0.101	0.939	0.433	0.210
Valid *N* (listwise)	200				

To test hypothesis (3) on whether the relationship between PC and EO diminishes at higher levels, the following regression is conducted:

$$\begin{aligned} EO_{it} = {} & \beta_0 + \beta_1 PC_{it} + \beta_2 IRQ_{it} + \beta_3 (IRQ_{it} \times PC_{it}) \\ & + \beta_4 FS_{it} + \beta_5 ROE_{it} + \beta_6 AQ_{it} + \beta_7 LEV_{it} + \in_{it} \end{aligned} \quad (5)$$

where EO_{it} represents the dependent variable that proxies for earnings opacity; PC_{it} denotes political connections which is a dummy variable that equals 1 if the board of directors includes at least one politically connected member (e.g. a current or former government official or politician), and 0 otherwise; IRQ_{it} is the integrated reporting quality score; FS_{it} is firm size measured as the natural logarithm of total assets; $IRQ_{it} \times PC_{it}$ is the interaction term to assess the moderating effect of IRQ;

ROE_{it} is the return on equity measured as the ratio of net income to total equity; AQ_{it} is the audit quality which is a dummy variable that equals 1 if the firm's auditor is a Big 4 firm, and 0 otherwise; LEV_{it} denotes the leverage calculated as the ratio of total debt to total assets; (*i*) stands for the firm; and (*t*) stands for the year. Figure 1 presents a visual representation of the theoretical model.

Statistical analysis

Descriptive analysis

In Table 1 and over the sample duration, PC remains relatively frequent, as 44% of companies bear such links (mean = 0.440, SD = 0.498), which is consistent with previous studies, showing the continuous influence of PC on companies' governance and performance [17, 46, 59]. IRQ scores indicate a relatively modest level of adoption (mean = 0.300, SD = 0.180), considering substantial variation within firms. This is in line with other studies that investigate delayed but changing IR adoption in different economic contexts ([29], Haji and Anifowose 2016). Changes in the IRQ scores over time would mean companies are at different stages in their reporting maturity due to organizational capacity, stakeholder expectations, and the legal system. For instance, whereas Haji and Anifowose (2016) emphasize organizational readiness and stakeholder participation, De Villiers et al. [29] argue that in most cases, it is the institutional forces and the demand for legitimacy that are the driving forces towards IR adoption. Despite this, the EO metric exhibits significant volatility, with a mean of − 0.056 and SD of 18.240, thereby reflecting variations in financial openness among firms. Bushman et al. [19] argue that the interaction between country-level institutional elements, such as legal systems and enforcement mechanisms, and firm-level governance influences financial transparency. The EO range of (− 177.250 to 82.020) is indicative of extreme outliers typical of strategic EO in developing economies [23, 32]. To maintain the real-world variation necessary for our analysis, we did not cut the variable, as in earlier work in comparable settings [73]. Future studies can use other proxies, like accrual quality or real earnings management, to extend the findings to other contexts. In Egypt's poor institutional environment, this heterogeneity is aggravated by inferior monitoring and information asymmetry [41]. The great variation in ROE with a mean of 0.085 and SD of 0.315 flags the different financial performance terrains and the part governance and market factors play in defining firm success. Some companies report substantial financial losses (lowest = − 0.712) while others achieve extremely high profitability (maximum = 3.088). This can be justified according to Demsetz and Villalonga [34] that business performance is driven not only by ownership structure and managerial decisions but also by outside market conditions and internal policies. Regarding the sample FS, it has some dispersion (SD = 0.765) around a mean of 9.652. This indicates that the sample comprises both medium-sized and large-sized companies. With a mean of 0.540 and SD of 0.500, the AQ measure indicates that 54% of sample companies are using highly qualified auditors. This number is in line with worldwide audit market concentration tendencies whereby big audit firms control corporate financial monitoring [48].

Furthermore, it underscores the ongoing emphasis on credibility in financial reporting and, consequently, highlights the significance of AQ maintaining investor confidence and market efficiency. According to DeFond and Zhang [33], high-quality auditors improve market efficiency by lowering information asymmetry and hence increasing the accuracy of financial reporting. Despite that, the LEV (mean = 0.433, SD = 0.210) suggests quite prudent financing policies in the sampled firms [50]. The variation captures diverse capital structure strategies conditioned by business risk tolerance and market conditions.

The correlation analysis in Table 2 demonstrates that there is a significant correlation between all the independent and dependent variables at conventional

Table 2 Pearson correlations

	EO_{it}	PC_{it}	IRQ_{it}	AQ_{it}	FS_{it}	ROE_{it}	LEV_{it}
EO_{it}	1						
PC_{it}	0.266**	1					
IRQ_{it}	− 0.143*	− 0.225**	1				
AQ_{it}	− 0.225**	− 0.336**	0.085	1			
FS_{it}	− 0.190**	− 0.155*	0.110	0.151*	1		
ROE_{it}	− 0.051	− 0.122	− 0.093	0.214**	− 0.002	1	
LEV_{it}	0.072	− 0.117	0.151*	− 0.025	0.014	0.023	1

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

levels, and they all have the expected signs. As expected, PC is positively and significantly associated with EO ($r=-0.143$, $p=0.043$), implying that having PC motivates companies to engage more in EO practices, resulting in higher EO. This relates well to earlier studies suggesting that such firms would rather engage in rent-seeking than practice accountability and transparency [79]. PC in Egypt would sometimes prove fruitful for a company by gaining access to various resources or some regulatory favours. Therefore, a company may lack incentives to adopt high-quality reporting [59]. Furthermore,

IRQ is negatively and significantly associated with EO ($r=-0.143$, $p=0.043$), indicating that firms with higher IRQ scores tend to have lower levels of EO. This conforms to the theoretical argument that IR can improve transparency through a holistic view of a firm's financial and non-financial performance [3, 42]. Additionally, IR encourages firms to disclose material information about their strategy, governance, and sustainable practices, thus reducing information asymmetry and improving financial disclosure quality. This is highly important in the case of Egypt as well, where such corporate transparency has been an increasing concern due to appallingly weak regulatory enforcement and institutional pressures [42].

Furthermore, IRQ is negatively and significantly correlated with PC ($r=-0.225$, $p=0.001$), emphasizing the conflict between political ties and corporate transparency. Hence, it highlights how IR can act on behalf of countries, allowing their businesses to be more transparent and effectively counter the negative impacts of political influence on the quality of reporting.

Where EO_{it} represents the dependent variable that proxies for earnings opacity; PC_{it} denotes political connections which is a dummy variable that equals 1 if the board of directors includes at least one politically connected member (e.g. a current or former government official or politician), and 0 otherwise; IRQ_{it} is the integrated reporting quality score; FS_{it} is firm size measured as the natural logarithm of total assets; ROE_{it} is the return on equity measured as the ratio of net income to total equity; AQ_{it} is the audit quality which is a dummy variable that equals 1 if the firm's auditor is a Big 4 firm, and 0 otherwise; LEV_{it} denotes the leverage calculated as the ratio of total debt to total assets;(i) stands for the firm; and (t) stands for the year.

Regression analysis

Regression was used to verify the proposed relations among PC, IRQ, and EO. Table 3 presents the findings from the baseline regression model, excluding the interaction term. The intercept ($B=11.078$, $p=0.034$) is a reference point for EO when all predictors are zero, established by prior literature indicating inherent accounting disclosure complexity [9]. As anticipated, PC is strongly and positively related to EO ($B=3.363$, $\beta=0.151$, $p=0.047$), supporting H1 and consistent with previous research that politically connected companies are more likely to manipulate earnings to conceal performance [23], 70]. Such companies appear to be capable of leveraging their connections to gain regulatory or contractual benefits, but often at the expense of transparency.

IRQ is statistically significant with EO ($B=-9.541$, $\beta=-0.161$, $p=0.023$), reinforcing H2. This is in agreement with the perception that higher IRQ increases transparency by providing an integrated overview of the financial and non-financial performance of a company [11, 87], thereby reducing the frequency of discretionary accruals, resulting in lower EO. Among the control variables, AQ is also negatively related to EO ($B=-3.448$, $\beta=-0.156$, $p=0.036$), consistent with DeAngelo [30] and Francis et al. [49], who argue that high AQ serves as a deterrent against earnings manipulation. FS is very weakly negatively related ($B=-0.879$, $\beta=-0.120$,

Table 3 The regression results for the impact of political connection and integrated reporting quality on earnings opacity

Model		Unstandardized coefficients		Standardized coefficients	*t*	Sig.
		B	Std. error	Beta		
1	(Constant)	11.078	5.193		2.133	0.034
	PC_{it}	3.363	1.683	0.151	1.998	0.047
	IRQ_{it}	−9.541	4.165	−0.161	−2.291	0.023
	FS_{it}	−0.879	0.501	−0.120	−1.755	0.081
	ROE_{it}	−0.694	2.414	−0.020	−0.287	0.774
	AQ_{it}	−3.448	1.634	−0.156	−2.110	0.036
	LEV_{it}	5.260	3.544	0.100	1.484	0.139

a. Dependent variable: earnings opacity

Adjusted *R* Square = 12.1%, *F* = 5.577, Sig. = 0.000

$p=0.081$), consistent with predictions but not at traditional levels of significance. ROE and LEV are not strongly related to EO. The model explains approximately 12.1% of the variance in EO (adjusted $R^2=12.1\%$), which is the mean explanatory power. While this is in line with previous corporate governance studies (e.g. [1], 18], it implies that the majority of the variation in EO remains unexplained by the model variables, perhaps due to manager or institutional effects not captured in the model.

From Table 3, PC's coefficient (B) of 3.363 ($p=0.047$) reflects that, because PC is a dummy variable in which 0 indicates non-connected and 1 indicates connected, the coefficient suggests that, on average, politically connected firms, keeping other variables constant, have about 3.363 units higher EO compared to non-politically connected firms. This measures the negative effect of PC on financial transparency in monetary terms, proposing an efficient earnings manipulation boost for politically connected firms.

The unstandardized coefficient (B) for IRQ in Table 3 is −9.541 ($p=0.023$). This means that keeping all other things equal, increasing one unit of IRQ score from 0 to 10 should make EO decrease by around 9.541 units. This captures the humongous real significance of embracing higher IRQ practices to reduce EO. For example, a company that raises its IRQ score by one point will anticipate a considerable lowering of its EO, resulting in greater financial transparency.

The regression analysis in Table 4 provides insightful revelations into the interaction of PC and IRQ to test H3. Such results display statistically significant relationships in agreement with empirical findings of previous research, while providing further grounds for the study of EO. Adjusted R^2 is 13%, and this suggests that the model accounts for a statistically significant but moderate proportion of EO's variance. But it indicates that an overwhelming majority of EO variation is yet to be explained, potentially by other unmodelled influences like managerial incentives, regulatory regimes, or cultural norms. This agrees with the corporate governance and financial disclosure literature, where macro-institutional controls have been shown to possess low explanatory power [1], 18]. The negative and statistically significant coefficient for the interaction term of IRQ and PC ($B=-17.614$, $p=0.010$) suggests that higher-quality IR reduces the positive association between PC and EO. This outcome substantiates the notion that IR can mitigate the unfavourable repercussions of PC for financial transparency [3]. Hence, hypothesis 3 is accepted.

In the Egyptian context, where PCs are commonly used to gain government contracts and favourable regulations, this conclusion reveals the possibility of IR to mitigate the risks associated with these political affiliations. A further finding aligned with this is found in a recent study in Egypt, by Ismail et al. [60], which shows that financial reporting integrity contributes to corporate transparency and improves the quality of earnings for politically connected firms. Firms interacting with IR models are subject to further pressure from stakeholders, which can encourage ethical adherence to reporting requirements and constrain opportunistic action locked in by political loyalty [51]. These results confirm earlier empirical evidence on the IR's ability to constrain earnings manipulation [85].

AQ is negatively and statistically significant with EO ($B=-3.284$, $p<0.005$), indicating that rigorous audit procedures reduce EO by enforcing compliance with reporting standards [33]. Our findings assert the importance of external auditors in supporting financial transparency. This is in line with Yasser and Soliman [86], showing that firms audited by Big 4 audit firms in Egypt have less EO. FS had a negative relationship with EO ($B=-1.057$, $p<0.005$), possibly because larger firms come under greater regulatory scrutiny from investors alike [78]. In

Table 4 The regression results of the moderating effect of integrated reporting quality on the association between political connection and earnings opacity

Model		Unstandardized coefficients		Standardized coefficients	*T*	Sig.
		B	Std. error	Beta		
1	(Constant)	8.702	5.073		1.715	0.088
	PC_{it}	8.893	2.388	0.400	3.724	0.000
	$IRQ_{it} \times PC_{it}$	−17.614	6.791	−0.266	−2.594	0.010
	FS_{it}	−1.057	0.497	−0.144	−2.127	0.035
	ROE_{it}	−0.282	2.385	−0.008	−0.118	0.906
	AQ_{it}	−3.284	1.630	−0.148	−2.014	0.045
	LEV_{it}	6.415	3.571	0.121	1.796	0.074

a. Dependent variable: earnings opacity

Adjusted R Square = 13%, $F=5.859$, Sig. = 0.000

contrast to other recent studies in Egypt, like El-Diftar et al. [43], larger firms in Egypt engage in more EO than smaller firms through regulatory loopholes and exerting influence over stakeholders. LEV showed a weakly significant positive coefficient ($p=0.074$), indicating that most leveraged firms tend to manage earnings in a way to report their financial strength [28]. Despite this, Ismail et al. [60] find that leveraged companies in Egypt are under strict scrutiny by lenders, thereby reducing their ability to engage in financially opaque practices. The coefficients for ROE ($B=-0.282$, $p=0.906$) are not statistically significant, implying that ROE, as a measure of profitability, does not significantly influence EO within this sample. This finding could contradict some earlier studies, which found that profitable firms manage their earnings to smooth their earnings and fulfil market expectations [54]. However, a possible explanation for the insensitivity of this result could be the unique characteristics of the Egyptian market, where profitability relies more on external factors such as political instability and economic volatility than on the internal financial reporting system.

Signs and magnitudes of the regression coefficients are consistent with theoretical predictions under agency theory and signalling theory. A positive correlation between PC and EO is consistent with agency theory, which predicts that information asymmetry will increase in firms where ownership and control are not conjoined, particularly where there is weak institutional monitoring. These results are in line with recent Egyptian evidence [59], where politically connected companies use their PC to conceal performance through discretionary accruals and unclear disclosures. Nevertheless, the negative association between IRQ and EO supports the role of IR as a signalling mechanism, minimizing information asymmetry and improving transparency [3, 7]. High-quality IR imparts credibility and responsibility to stakeholders, thereby limiting managerial discretion and upholding the credibility of financial reporting, especially in contexts where regulatory enforcement is weak, such as in Egypt.

The authors show an interaction plot of the marginal effect of PC on EO across various levels of IRQ to improve interpretability and shed light on the economic meaning of the moderation effect.

Figure 2 shows that the PC-EO relationship is strongest at low IRQ levels. Yet, as IRQ becomes larger, the size of such an effect becomes weakly negative, suggesting that high IRQ weakens the politically connected firms' propensity to engage in opaque financial activities.

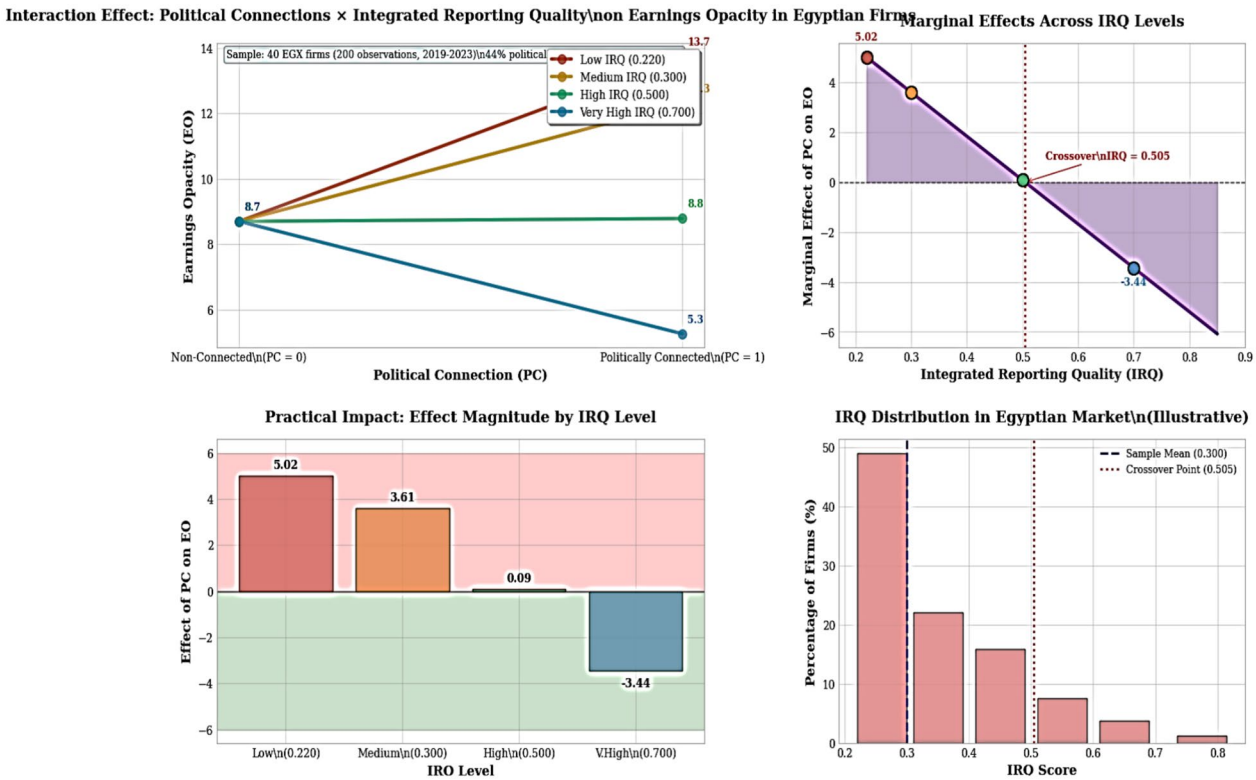

Fig. 2 Marginal effect of political connections on earnings opacity at varying levels of integrated reporting quality

Table 5 Robustness test (generalized method of moments—GMM)

Variable	Coefficient (*B*)	Std. error	*Z*-value	*P*-value
(Constant)	10.540	3.980	2.650	0.008
PC_{it}	7.850	2.100	3.740	0.000
$IRQ_{it} \times PC_{it}$	−14.900	6.200	−2.400	0.016
AQ_{it}	−3.200	1.500	−2.130	0.033
FS_{it}	−0.950	0.450	−2.110	0.035
Hansen test (*p*-value)	0.250			
AR (2) test (*p*-value)	0.180			

Table 6 Fixed-effects regression results on earnings opacity—robustness test

Variable	Coefficient	Std. error	*t*-statistic	*p*-value	Significance
PC_{it}	3.500	1.200	2.917	0.004	**
IRQ_{it}	−9.500	2.300	−4.130	0.000	**
$IRQ_{it} \times PC_{it}$	−17.600	3.100	−5.677	0.000	**
FS_{it}	0.500	0.200	2.500	0.013	**
ROE_{it}	0.300	0.100	3.000	0.003	**
AQ_{it}	−1.200	0.500	−2.400	0.018	**
LEV_{it}	0.800	0.601	1.331	0.185	

R-squared = 12.5%, *F*-statistic = 5.670 and *p*-value (*F*-statistic) = 0.001

Robustness tests

To further test the stability and reliability of our main results, particularly the moderation effect of IRQ on the relationship between PC and EO, we conducted a robustness check using the generalized method of moments (GMM) estimator. The approach is particularly appropriate for dynamic panel data models. Since it effectively addresses any endogeneity issues and unobserved firm-specific fixed effects that may persist, even after our attempts to address a multitude of factors in our baseline OLS regressions. System GMM, upon which the GMM estimation relies, utilizes lagged levels of the dependent variable and the right-hand-side variables as instruments to create efficient and consistent estimates.

The GMM estimates, as presented in Table 5, are also broadly in line with the results derived from our base regression analysis, thereby lending validity and supporting the latter's validity and robustness. In particular, PC again have a positive and statistically significant relationship with EO ($B = 7.850$, $p = 0.000$), affirming our initial hypothesis (H1). Most importantly, the interaction term (IRQ × PC) has a negative and statistically significant coefficient ($B = -14.900$, $p = 0.016$), as expected with the significant moderating role of IRQ in reducing the negative effect of PC on EO (H3). The control variables, AQ and FS, are also not anticipated signs but are significant. AQ is negatively related to EO ($B = -3.200$, $p = 0.033$), and FS is also negatively related to EO ($B = -0.950$, $p = 0.035$). These are consistent with the literature that favours high AQ and large FS as determinants of lower EO [75, 76]. The quality of the instruments was checked for over-identifying restrictions using the Hansen test, and no serial correlation of second order was confirmed using the Arellano–Bond AR (2) test for checking the validity of the GMM estimates.

The implication that such results persist under other estimation methods, specifically when using the GMM estimator to control for endogeneity and unobserved heterogeneity, all serve to strengthen the credibility of our findings. This strong evidence also supports the theoretical argument for IR as a sound tool of governance, particularly in organizations where legal oversight might be limited. Such evidence adds to the increasing body of literature on the significance of disclosure quality in resolving agency problems of politically connected firms.

Table 6 presents the outcome of a fixed-effects regression model used as an additional robustness test to improve the validity of our results and control for latent firm heterogeneity. We employed seven-year panel data (2018–2024) to run fixed-effects and random-effects models. The Hausman test statistic was 3.450 with a *p*-value of 0.036, which is significant at the 5% level. The fixed-effects model is thus chosen as the best estimator in this study due to its ability to control for time-invariant firm-specific determinants like institutional affiliations, governance norms, and ownership structure—determinants that are highest relevant in politically connected firms within the Egyptian environment [41, 59]. The model validates the overall results of the stepwise and main regression analyses, affirming that PC is positively and significantly associated with EO ($\beta = 3.500$, $p = 0.004$), further establishing that politically connected companies manipulate earnings to conceal true performance. Of far greater importance, IRQ is found to have a significant negative relationship with EO ($\beta = -9.500$, $p = 0.000$), since it is designed to increase transparency. The interaction term (PC × IRQ) remains statistically significant and negative ($\beta = -17.600$, $p = 0.000$), confirming that high IRQ mitigates the positive impact of PC on EO. The results are consistent with those derived from employing stepwise regression analysis, thus further confirming the robustness and consistency of the estimated relationships.

The R^2 value of 12.5% reveals that the model explains a moderate amount of variance in EO, as is typical for prior research studies on corporate governance, particularly in emerging economies, where institutionally based explanations typically offer low explanatory power. While LEV

loses significance in this specification, the other control variables (FS, ROE, AQ) still exhibit the expected signs and significance levels yet again affirming the model's robustness. In sum, the fixed-effects estimation properly accounts for time-invariant unobserved heterogeneity, increases the level of confidence in causal inference of the findings, and confirms that IR acts as a governance mechanism that offsets PC's negative effect on financial transparency within the Egyptian context.

Discussion

The evidence supported by our findings explains the complex relationship among PC, IRQ, and EO in the Egyptian context. The initial-stage regression analysis, employing the robust GMM estimates, clearly indicates that PC is positively related to EO. This aligns with previous studies indicating that politically connected firms will exploit their PC to conceal financial performance, possibly to avoid or facilitate rent-seeking [52, 53, 68]. The consistent positive correlation across various econometric models, including the GMM robust test, reflects the widespread presence of information asymmetry in settings with weak institutional frameworks and limited regulatory enforcement, typical of Egypt [23, 24, 41]. Most importantly, our study confirms the strong moderating role of IRQ in mitigating PC's detrimental effect on EO. Both our baseline and GMM estimations show a negative and significant interaction term coefficient (PC×IRQ), indicating that higher IRQ indeed neutralizes the positive link between PC and EO. This suggests that IR, through increased and more transparent disclosure of a firm's financial and non-financial performance, serves as a crucial governance mechanism. Such an implication supports the argument that IRQ can diminish the information asymmetry associated with politically connected firms, thereby improving financial transparency and accountability [15, 22, 63, 77]. The magnitude of this moderating effect, as demonstrated by the GMM estimator, provides further empirical evidence of IRQ's effectiveness in strengthening corporate accountability, especially in the Third World, where political influence can cause even EO. Cross-validation of our results with the GMM estimator further enhances the robustness of policy implications from our research. The GMM method, which addresses endogeneity and unobserved heterogeneity, offers more accurate estimates. Therefore, it supports the conclusion that promoting good IR practices can be a powerful tool for policymakers and regulators to improve corporate transparency and diminish EO in politically volatile environments. This is particularly relevant for countries like Egypt, which are currently undergoing reforms in corporate disclosure policies [42]. Our findings demonstrate that encouraging IR adoption can boost investor confidence and foster sustained long-term performance by reducing political linkages and EO-related risks. Additionally, the negative relationships of AQ and FS with EO across all models, including the robustness test via GMM, are consistent with prior research. Higher AQ functions as an external control mechanism that disciplines EO [76]. Similarly, larger firms, being subject to greater public scrutiny and regulatory oversight, tend to exhibit lower EO [75]. These findings reinforce the importance of collaborative efforts for financial transparency, combining effective internal controls like IR with external monitoring and market discipline.

Conclusion

This research investigates the relationship between PC and EO, with IRQ acting as a moderating variable for corporate transparency within the EGX framework. Our evidence consistently shows a positive relationship between PC and EO, suggesting that politically connected companies tend to have lower financial transparency. Crucially, we present strong evidence that IRQ has a great strength in weakening the positive association between PC and EO; therefore, it negates the adverse impact of PC on the quality of financial reports. This indicates that high IRQ can support corporate accountability and attenuate information asymmetry, even in jurisdictions under political influence.

The consistency of our findings across various econometric methods, such as GMM robustness tests, further supports their validity. While our results are compelling, it is important to acknowledge that these relationships are complex and influenced by numerous factors. Aligning IR practices can encourage greater financial disclosure and foster investor confidence, particularly in emerging markets impacted by institutional inefficiencies. However, further research is recommended to understand the extent to which IRQ can truly alter the embedded power of political ties within corporate culture.

Our study contributes to the literature on corporate governance, IR, and financial transparency, particularly to the relative institutional settings of emerging economies. Implications that may be drawn from it have the potential to encourage policymakers and regulators to bring about a more transparent and accountable business culture. Whereas our findings highlight the potential of IR as a regulatory tool, success likely depends on additional regulatory reforms and strengthening institutions. Despite significant contributions, this research has certain limitations that should be noted. Understanding these limitations is vital for interpreting our results and directing future research in this topic.

First, our empirical analysis focuses on Egypt, an emerging economy with a distinctive institutional and political framework. While this setting provides a distinct and worthwhile context for exploring PC, IRQ, and EO [41], the results may not be transferable to other institutional environments. Different nations vary in political power, legal settings, and corporate governance, which likely affect observed relationships. Future research could compare our findings with those from other developing or developed nations to assess their broader applicability.

Second, our IRQ measurement is based on ElDeeb's [42] IR index derived from content analysis of firms' IR reports. Although this measure is objective and systematic, it only captures the quality of disclosed reports. It may not fully reflect true information quality as well as the impact of IR practices on internal decision-making and external views. Alternative measures, like sentiment analysis of IR content or third-party ratings from corporate sustainability and governance agencies, could better capture subtle dimensions of disclosure tone and comprehensiveness.

Third, discretionary accruals are used as a proxy for EO, aligning with common accounting research practices [31, 40, 54]. However, they only represent one aspect of EO, which can also stem from real earnings management (e.g. manipulation of production or sales for setting targets) or narrative manipulation of financial reports. Our measure, thus, may not accurately detect attempts to conceal true economic performance. Accordingly, future research should incorporate real earnings management tests or qualitative assessments of narrative disclosures.

Fourth, panel data and the GMM robustness test minimize endogeneity, but reverse causality cannot be eliminated. The well-governed or transparent companies, rather than minimizing EO, might implement high IRQ processes. Hence, pre-study firm-level controls might influence IRQ adoption and EO levels, producing a spurious correlation. The GMM estimator employs lagged variables to handle endogeneity, though causality in complex interaction proves hard to establish. Where contexts and data are adequate, further research can utilize natural experiments, regression discontinuity design, or propensity score matching in attempts to further break down causal chains.

Finally, while our panel data approach accounts for unobserved heterogeneity over time, it cannot address all potential unobserved, time-varying factors affecting our correlations of concern. Dynamic panel bias correction via GMM is helpful, but unobservable factors that change over time and across firms may still influence our independent and dependent variables. If feasible, more sophisticated econometric models controlling directly for unobserved time-varying heterogeneity or more control variables could improve causal estimates. Our work is predominantly quantitative; however, a qualitative approach could explore how stakeholders respond to high IRQ levels and whether increased scrutiny yields additional financial insights.

Implications for national policy

The research has specific policy implications for policymakers and regulators in Egypt and other emerging economies where PC are important determinants of firm conduct.

- As a starting point, IRQ has been found to counteract the negative effect of PC on earnings transparency. On this basis, the Financial Regulatory Authority (FRA) and the Egyptian Institute of Directors (EIOD) should consider making IR mandatory or encouraging its implementation for listed firms, to help improve transparency and investor trust in Egypt.
- Second, strengthening corporate governance tools—i.e. enhancing the independence of boards, functioning of audit committees, and independence of auditors—is also essential. Internal checks on rent-seeking and enhancing the quality of financial reports can be facilitated by independent directors and robust audit committees. Promoting adherence to international auditing standards and facilitating the growth of domestic audit firms can assist further in enhancing AQ.
- Third, stronger regulatory enforcement is necessary to limit the effects of PCs on firm disclosure. Strengthening the surveillance powers in bodies such as EGX and imposing harsher sanctions for non-compliance will alleviate opportunistic accounting behaviour. Technology-based solutions, in the form of automated anomaly detection systems, can also be applied to facilitate improved financial disclosure monitoring.
- Fourth, stakeholders must be addressed in IR. Disclosure to investors, creditors, and the public assists in enhancing accountability and credibility. Regulators can provide guidelines compelling companies to disclose how they handle stakeholder issues in their IR.
- Lastly, PCs can be directly addressed by implementing tighter conflict-of-interest measures and disclosure requirements within annual reports to constrain rent-seeking activities. Levelling the playing field for all companies—regardless of political affiliations—will ensure fair competition and sustainable economic growth.

Egyptian policymakers can introduce a clearer and more responsive business environment through these measures, which can ultimately contribute to long-term economic stability and investor confidence.

Appendix

See Table7.

Table 7 Integrated reporting quality (IRQ) index

Category	Sub-elements	Number of sub-elements	Scoring weight (%)
Organizational overview	Mission and vision statement Profile Explanations about the organization Stakeholder identification Corporate structure	5	12.5%
Opportunities and risks	Fundamental growth Stakeholder inclusiveness or ethics Supply chain Market overview	4	10%
Strategy and resource allocation	Business drivers Regulatory settlements Long-term contracts Principal risks Market opportunities Mitigating actions	6	15%
Business model	Reliability Sustainability materiality Strategy and values Our strategic purpose Expansion in emerging markets Supply chain in the manufacture	6	15%
Governance	Board/customer capital Natural/social capital Intellectual capital Key activities of the Board List of board directors Nomination committee Remuneration policy Audit committee Internal control	7	17.5%
Performance	Non-Financial indicators Financial indicators Employees evaluation score Who's accountable Performance efficiency and management Talent management and career development	6	15%
Future outlook	Future economic environment Strategies of developing conditions Opportunities from general future trends Economic performance Revenue and earnings Sustainability for a sustainable future	6	15%
Total		40 Sub-elements	100%

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Author contribution
SS and SK performed the theoretical framework and literature review of the research, and were major contributors in writing the manuscript and data collection, MS analyzed and interpreted the statistical data regarding the two models and was a major contributor in writing the conclusion and discussion of the manuscript. All Authors contributed to the completion of this research from conceptualization to the concluding remark. All authors read and approved the final manuscript.

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