

# Does Disclosure Quality through Investor Relations Lower the Cost of Equity Capital? Evidence from the Mediating Role of Information Asymmetry in Egypt

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## Abstract

This study examines whether investor relations disclosure quality reduces the cost of equity capital directly and indirectly through information asymmetry in Egyptian listed non-financial firms. Using panel data for 50 firms over the period 2018–2024, the study measures investor relations disclosure quality through a content-analysis-based index that captures the accessibility, timeliness, usability and investor relevance of disclosed information. The cost of equity capital is estimated using a CAPM-based measure, while information asymmetry is proxied by the relative bid-ask spread. The hypotheses are tested using panel regression models with industry and year fixed effects, firm-clustered robust standard errors and regression-based mediation analysis with bootstrapped indirect effects. The findings show that higher investor relations disclosure quality is significantly associated with a lower cost of equity capital and lower information asymmetry. The mediation results further indicate that information asymmetry partially transmits the effect of investor relations disclosure quality on the cost of equity capital. These findings suggest that accessible, timely and useful investor-oriented disclosure improves the public information environment and reduces equity financing costs. The study contributes to investor relations and disclosure research by focusing on disclosure quality rather than the mere existence of investor relations channels and provides emerging-market evidence from Egypt.

**Keywords:** Investor relations disclosure quality; cost of equity capital; information asymmetry; disclosure quality; emerging markets.

## 1. Introduction

Capital markets price firms not only through reported numbers, but also through the quality of the information environment in which these numbers are explained and made credible. High-quality disclosure reduces the distance between corporate insiders and outside investors by improving investors' ability to assess firm value, future cash flows and managerial actions. This role becomes particularly important when firms communicate directly with capital-market participants through investor relations, which represents a market-facing channel for shaping investor attention, information processing and market confidence (Healy & Palepu, 2001); (Volant, 2025).

Investor relations disclosure quality differs from generic online reporting because it is directed mainly toward investors, analysts and financial-market users. It includes financial information, strategic explanations, investor presentations, market updates, shareholder services and direct communication tools. Prior research shows that professional investor relations functions are associated with stronger disclosure activity, analyst following, institutional ownership, liquidity and market valuation, while investor relations officers help mediate communication between management and the investment community (Kirk & Vincent, 2014); (Brown, Call, Clement, & Sharp, 2019).

The economic value of investor relations disclosure quality is expected to appear in the firm's cost of equity capital. Clearer, timelier and more accessible firm-specific information may reduce estimation risk, improve liquidity and lower the return required by shareholders. Prior evidence from Japan and South Africa supports this view, although the strength of the relationship may depend on firm characteristics, market conditions and cost-of-equity measurement choices (Ly, 2010); (Nel, G. F.; Smit, E.; Brummer, L. M., 2018).

Information asymmetry provides a key channel through which investor relations disclosure quality may affect the cost of equity capital. More informative disclosure can reduce adverse selection by increasing the precision and availability of public information, thereby lowering investors' required return. However, prior evidence suggests that this mediating channel may vary across institutional and disclosure environments (Cuadrado-Ballesteros, García-Sánchez, & Martínez Ferrero, 2016); (Bhatia & Kaur, 2024).

This study examines whether investor relations disclosure quality reduces the cost of equity capital among Egyptian listed non-financial firms and whether information asymmetry mediates this relationship. Egypt provides a relevant emerging-market setting because listed firms face uneven disclosure practices, variable investor attention and financing frictions. The study contributes by focusing on investor relations disclosure quality as a specialized market-facing disclosure mechanism, testing information asymmetry as a mediating channel and providing evidence from the Egyptian capital market (Omran & Pointon, 2005); (Abdi & Omri, 2020); (Abu Afifa & Saadeh, 2025).

## 2. Literature Review and Hypotheses Development

### 2.1 Investor Relations Disclosure Quality as a Disclosure Governance Mechanism

Investor relations disclosure quality represents a specialized form of market-oriented disclosure directed primarily toward investors, analysts and other capital-market participants. Unlike general corporate reporting, which may address a broad set of stakeholders, investor relations disclosure focuses on providing capital-market users with timely, accessible, reliable and decision-useful information. Its quality therefore depends not merely on the availability of information, but on the extent to which financial, non-financial and strategic information is organized, updated, understandable and relevant to investment decisions. Accordingly, investor relations disclosure quality can be viewed as the firm's ability to transform corporate information into credible signals that reduce the informational distance between insiders and external market participants (Healy & Palepu, 2001); (Bollen, Hassink, & Bozic, 2006); (Chang, D'Anna, Watson, & Wee, 2008); (Gackowski, 2017); (Liang & Cao, 2024).

This interpretation is consistent with disclosure theory, which emphasizes the role of corporate disclosure in mitigating agency conflicts and information asymmetry between managers and outside investors. Since managers generally possess superior information about firm performance, risks and future prospects, investors rely on public disclosure to assess firm value, expected cash flows and managerial actions. From this perspective, investor relations disclosure quality may function as a disclosure governance mechanism because it enhances transparency, reduces information-processing costs and strengthens market-based monitoring (Healy & Palepu, 2001); (Bassen, Basse Mama, & Ramaj, 2010).

The governance role of investor relations becomes more evident when investor relations is treated as an active communication function rather than a passive reporting channel. Prior research shows that professional investor relations functions are associated with stronger disclosure activity, greater analyst following, higher institutional ownership, improved liquidity and higher market valuation (Kirk & Vincent, 2014). Investor relations and stakeholder communication may also have financing implications by affecting both the cost of debt and the cost of equity capital (Bhabra, Kolahgar, & Ravi, 2020). Moreover, investor relations officers contribute to managing the corporate narrative, preparing disclosure events and mediating communication between management, analysts and institutional investors (Brown, Call, Clement, & Sharp, 2019). Thus, investor relations disclosure quality depends on how information is selected, explained, updated and transmitted to the market, rather than on the act of publishing information alone.

Internet investor relations research further highlights the importance of distinguishing disclosure quality from disclosure presence. A firm may maintain an investor relations webpage, yet the information provided may be outdated, incomplete, difficult to navigate or weakly connected to investors' decision needs. Therefore, the existence of an

investor relations channel does not necessarily indicate effective disclosure. This distinction explains why recent measurement approaches have moved beyond simple presence-or-absence checklists toward quality-sensitive indices that assess the breadth, accessibility, timeliness, usability and investor relevance of disclosed information (Bollen, Hassink, & Bozic, 2006); (Nel G. F., 2016); (Nel & Brummer, 2016).

Methodologically, this shift is important because binary disclosure measures may treat symbolic and substantive disclosure as equivalent. For example, an annual report may be available online but outdated, poorly organized, inaccessible in a usable format or not clearly linked to the relevant fiscal year. Nel and Brummer (2016) therefore provide an important contribution by developing a comprehensive instrument for internet investor relations quality based on best-practice guidelines, prior literature, pilot testing and reliability and validity assessment. In the same vein, Nel (2016 ) emphasizes the value of partial scoring because disclosure quality lies on a continuum: information may be fully useful, partially disclosed, outdated, incomplete or difficult to access. This logic supports the current study's three-point scoring procedure, in which investor relations items are coded as fully disclosed, partially disclosed or not disclosed.

In emerging markets, investor relations disclosure practices are shaped by firm-level and institutional factors, including firm size, ownership structure, number of shareholders, industry type and market transparency needs (AbuGhazaleh, Qasim, & Roberts, 2012). In Egypt, investor relations disclosure quality has particular regulatory and institutional significance. The Egyptian Exchange describes investor relations as a bridge between listed companies, current and potential investors, the capital market, the business community and the media, and links it to transparency, credibility and continuous communication through integrated high-quality disclosures about performance, activities, governance, sustainability and future plans. In addition, the executive procedures of the Egyptian listing and delisting rules assign responsibilities to the investor relations manager, indicating that investor relations in Egypt is a formal market-facing disclosure channel rather than a purely voluntary communication practice (Egyptian Exchange, 2018, 2019).

Nevertheless, investor relations disclosure should be examined critically. Although it may reduce information frictions and enhance investor confidence, it may also be used selectively to emphasize favourable information, manage impressions or frame corporate performance positively. (Karolyi, Kim, & Liao, 2020) argue that investor relations can broaden investor recognition and reduce information frictions, but it may also involve strategic communication. Recent evidence linking investor relations activities, including private in-house meetings, to stock crash risk further indicates that investor relations has meaningful capital-market consequences and should be assessed in terms of credibility, balance, timeliness and decision usefulness (Karolyi, Kim, & Liao, 2020); (Zhou, Ding, Li, & Sun, 2025). Taken together, the literature suggests that investor relations disclosure quality is theoretically important and methodologically distinct; therefore, the current study treats it

as a substantive disclosure governance mechanism rather than a simple indicator of online disclosure presence (Modro, Junior, Koshio, Gaio, & Belli, 2023).

## 2.2 Investor Relations Disclosure Quality and the Cost of Equity Capital

The cost of equity capital refers to the return required by shareholders for providing equity financing to the firm. From an information-based perspective, this required return increases when firm-specific information is incomplete, delayed, unclear or unevenly distributed among market participants. Disclosure theory suggests that higher-quality disclosure can reduce the cost of equity by lowering estimation risk, improving investors' ability to forecast future cash flows and reducing uncertainty about firm risk. Disclosure may also enhance market liquidity by mitigating adverse selection between informed and uninformed investors, thereby reducing the return premium demanded by shareholders (Diamond & Verrecchia, 1991); (Healy & Palepu, 2001).

Investor relations disclosure quality is directly linked to the cost of equity capital because it targets the same investors, analysts and market participants who price the firm's shares. High-quality investor relations disclosure provides financial reports, strategic explanations, earnings announcements, investor presentations, shareholder information, governance disclosures and direct communication channels. These disclosure elements can improve investors' interpretation of firm performance, risk exposure and future value, thereby reducing the information-risk component embedded in shareholders' required return. Accordingly, stronger investor relations practices are expected to lower the cost of equity by making firm-specific information more accessible, timely, credible and decision-useful (Ly, 2010).

Empirical evidence generally supports the expected negative association between investor relations disclosure and financing costs. (Ly, 2010) finds that investor relations is negatively associated with the cost of capital among Japanese firms after controlling for self-selection bias. Similarly, evidence from South Africa indicates that internet investor relations is negatively related to both the cost of equity and the broader cost of capital among firms listed on the Johannesburg Stock Exchange. However, this relationship is not entirely uniform, as its strength may depend on the cost-of-equity measure used, firm size and market liquidity, particularly among smaller and less liquid firms (Nel G. F., 2016); (Nel, G. F.; Smit, E. v. d. M.; Brümmer, L. M., 2019). This evidence is also consistent with the broader voluntary disclosure literature, which identifies two main mechanisms through which disclosure may reduce the cost of capital: an estimation-risk channel, through which disclosure improves the precision of expected future cash flows, and a liquidity channel, through which disclosure reduces adverse selection and trading frictions (Botosan, 1997); (Diamond & Verrecchia, 1991); (Bhatia & Kaur, 2024).

Nevertheless, the relationship between disclosure and the cost of equity capital should not be treated as automatic. Some disclosures may reveal rather than reduce risk, especially when they expose operational uncertainty, governance weaknesses or financial

vulnerability. Moreover, disclosure volume does not necessarily indicate disclosure usefulness; information may be extensive but outdated, promotional, difficult to verify or weakly connected to investors' decision needs. This explains why some studies report weak, insignificant or mixed relationships between disclosure and the cost of capital (Richardson & Welker, 2001); (Verrecchia, 2001); (Abu Afifa & Saadeh, 2025). This concern is particularly relevant to investor relations disclosure, because its capital-market value depends on the credibility, specificity, timeliness, accessibility and usability of information rather than the mere existence of an investor relations channel or the amount of information disclosed (Hassin & Bollen, 2006); (Nel G. F., 2016); (Nel & Brummer, 2016).

In emerging markets, the association between investor relations disclosure quality and the cost of equity capital may be even more context-dependent. Market participants often operate under higher uncertainty, weaker liquidity, lower analyst coverage and uneven disclosure practices. Evidence from GCC markets suggests that disclosure may affect the cost of equity under institutional conditions characterized by information frictions and developing capital-market structures (Al-Hadi, Taylor, & Hossain, 2016). Under such conditions, high-quality investor relations disclosure may improve investor confidence and reduce valuation uncertainty. At the same time, limited reliance on corporate disclosure, credibility concerns and macroeconomic volatility may weaken the direct effect of disclosure quality on equity financing costs. This is consistent with emerging-market evidence showing that disclosure-cost of capital relationships are shaped by uncertainty, financing frictions and institutional conditions, and with investor relations research indicating that market benefits depend on credibility, usefulness and investor reliance on disclosed information (Nel G. F., 2016); Nel et al., 2018; (Abu Afifa & Saadeh, 2025).

Although prior research suggests that disclosure and investor relations may reduce financing costs, much of the existing evidence focuses on general voluntary disclosure, annual report disclosure, sustainability disclosure or broad web-based disclosure. Recent evidence further shows that investor relations may have financing consequences beyond public equity markets, including private debt markets, which reinforces its economic relevance as a market-facing communication function (Chapman, Lee, Reiter, & Williams, 2025). In Egypt, prior evidence has examined disclosure through investor relations websites in relation to stock liquidity and the cost of capital, but further evidence is still needed on investor relations disclosure quality as a specialized investor-oriented construct and on its specific association with the cost of equity capital among non-financial listed firms (Al-Shazly, 2022). This creates an important research gap in the Egyptian market: whether higher-quality investor relations disclosure can reduce the cost of equity capital. Accordingly, the first hypothesis is formulated as follows:

**H1: Investor relations disclosure quality is negatively associated with the cost of equity capital.**

### 2.3 Information Asymmetry as the Transmission Channel

Information asymmetry arises when managers or certain investors possess superior information about firm value, risk and future prospects compared with outside or less-informed investors. In equity markets, this imbalance creates adverse selection risk because uninformed investors may trade against better-informed parties. As a result, they may demand higher expected returns, reduce trading activity or require wider bid-ask spreads as compensation for information risk. Accordingly, information asymmetry represents a central mechanism through which disclosure quality may influence capital-market outcomes, particularly liquidity and the cost of equity capital (Akerlof, 1970); (Leuz & Verrecchia, 2000); (Brown & Hillegeist, 2007); (Arruda, Girão, & Lucena, 2015).

Because information asymmetry cannot be observed directly, prior studies commonly use market-based proxies such as bid-ask spread, price impact, share price volatility, share turnover and analyst following. Among these proxies, the bid-ask spread is widely used because it captures adverse-selection-related trading costs: wider spreads indicate greater information risk, whereas narrower spreads suggest a stronger public information environment. Although alternative proxies may reflect different dimensions of information quality, bid-ask spread remains one of the most theoretically grounded and empirically supported measures of information asymmetry (Nel, 2016; (Huynh, Wu, & Duong, 2020).

Investor relations disclosure quality may reduce information asymmetry by improving the availability, timeliness, accessibility and interpretability of investor-relevant information. High-quality investor relations channels centralize financial and strategic disclosures, reduce investors' search costs, provide timely updates through earnings releases, financial calendars and market announcements, and facilitate interpretation through investor presentations, direct communication tools, conference calls and online participation mechanisms. Through these functions, investor relations disclosure may narrow the informational distance between firms and market participants and strengthen the public information environment available to investors (Nel G. F., 2016); (Rodrigues & Galdi, 2017); (Ayagi & Salisu, 2023).

Empirical investor relations studies provide support for this argument. (Chang, D'Anna, Watson, & Wee, 2008) show that higher internet-based investor relations disclosure quality is associated with lower bid-ask spreads, although the effect may weaken after controlling for other market factors. (Rodrigues & Galdi, 2017) similarly find that more informative investor relations websites are associated with lower information asymmetry among Brazilian listed firms. Nel (2016) provides further evidence using several proxies, showing that internet investor relations is negatively related to bid-ask spread and price impact and positively related to share turnover and analyst following. However, its insignificant association with share price volatility suggests that the effect of investor

relations disclosure may vary according to the proxy used to capture information asymmetry (Chang, D'Anna, Watson, & Wee, 2008); (Rodrigues & Galdi, 2017).

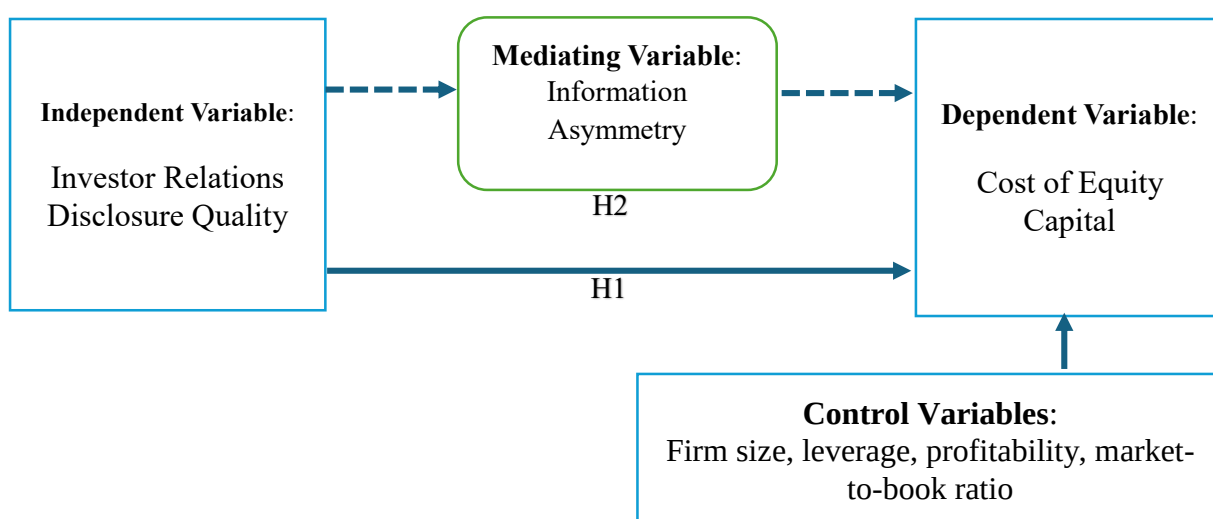
The second link in the transmission channel concerns the effect of information asymmetry on the cost of equity capital. When information asymmetry is high, investors face greater uncertainty about firm value and a higher probability of trading against informed investors. This reduces their willingness to supply liquidity and increases the return they require for holding the firm's shares. Prior evidence therefore supports a positive association between information asymmetry and the cost of capital, suggesting that information risk may be priced by investors, particularly in imperfect markets (Botosan, 1997); (Armstrong, Core, Taylor, & Verrecchia, 2011); (Muslim & Setiawan, 2021); (Abu Afifa & Saadeh, 2025).

Accordingly, information asymmetry provides a theoretically plausible mediation channel between investor relations disclosure quality and the cost of equity capital. The proposed logic is sequential: high-quality investor relations disclosure improves the public information environment; a stronger information environment reduces information asymmetry; lower information asymmetry reduces adverse selection and liquidity risk; and lower information and liquidity risk should reduce shareholders' required return. This reasoning is consistent with corporate governance research that treats information asymmetry as a mechanism through which governance-related practices influence financial outcomes, and with disclosure studies showing that disclosure may affect the cost of capital indirectly through information asymmetry. However, the mediating role of information asymmetry remains empirically inconclusive.

While (Bhatia & Kaur, 2024) find that voluntary disclosure reduces the cost of equity directly and indirectly through information asymmetry in India, (Abu Afifa & Saadeh, 2025) find that, although voluntary disclosure reduces both information asymmetry and cost of capital in Jordan, information asymmetry does not necessarily mediate this relationship. This inconsistency indicates that the indirect channel may depend on disclosure credibility, market efficiency, analyst attention, investor reliance on public disclosure, market-wide risk, thin trading, macroeconomic volatility, ownership concentration and the sensitivity of CAPM-based estimates to market-return fluctuations. Therefore, Egypt provides a relevant setting for examining whether investor relations disclosure quality reduces equity financing costs through information asymmetry, especially because most prior mediation studies focus on general voluntary disclosure rather than investor relations disclosure quality as a specialized investor-oriented disclosure mechanism (Tahir, Qamar, Nazir, & Usman, 2019); (Cuadrado-Ballesteros, García-Sánchez, & Martínez Ferrero, 2016); (Setiany & Suhardjanto, 2021); (Bhatia & Kaur, 2024); (Abu Afifa & Saadeh, 2025); (Armstrong, Core, Taylor, & Verrecchia, 2011); (Nel G. F., 2016); (Al-Hadi, Taylor, & Hossain, 2016); (Chang, D'Anna, Watson, & Wee, 2008); (Rodrigues & Galdi, 2017). Based on the above discussion, the second hypothesis is formulated as follows:

## H2: Investor relations disclosure quality has a negative indirect effect on the cost of equity capital through reducing information asymmetry.

Based on the preceding arguments and hypotheses, the study develops a conceptual framework linking investor relations disclosure quality to the cost of equity capital through information asymmetry. Investor relations disclosure quality represents the independent variable, information asymmetry the mediating variable, and cost of equity capital the dependent variable. The model also controls for firm size, leverage, profitability and market-to-book ratio, as shown in **Figure 1**.



**Figure 1. Conceptual framework of the study.**

## 3. Research Methodology

### 3.1 Empirical Objective and Research Design

This section outlines the empirical design used to test the study hypotheses, including the research objective, sample selection, data sources, variable measurement, model specification and statistical procedures. The study examines whether investor relations disclosure quality is associated with a lower cost of equity capital and whether information asymmetry mediates this relationship. It adopts a quantitative archival design based on firm-year observations for Egyptian listed non-financial firms during 2018–2024, with investor relations disclosure quality as the independent variable, cost of equity capital as the dependent variable and information asymmetry as the mediating variable. This design is consistent with prior disclosure and cost-of-capital research examining whether higher-quality investor-oriented disclosure improves the information environment and reduces investors' required return (Ly, 2010); (Bhatia & Kaur, 2024).

### 3.2 Study Population, Sample and Data Sources

The study population comprises non-financial companies listed on the Egyptian Exchange during 2018–2024. Financial institutions, including banks and non-bank financial services companies, are excluded because their regulatory frameworks, capital requirements, risk-reporting rules and financing structures differ from those of industrial, commercial and service firms. The final sample includes 50 non-financial listed firms observed over seven years, yielding a balanced panel of 350 firm-year observations. Firms were retained only when annual reports, audited financial statements, investor relations webpages or related disclosure records, market data and all variables required for the analysis were available for the full period; firms with missing, unverifiable or inconsistent data, or those delisted before the end of the period, were excluded.

Data were hand-collected from annual reports, audited financial statements, corporate websites, investor relations sections, Egyptian Exchange disclosures and publicly available market-data platforms, including Mubasher Egypt, the Egyptian Information Dissemination Company and other official or recognized sources. Investor relations disclosure items were coded using a consistent firm-year protocol based on information attributable to the relevant fiscal year; undated website information was included only when it could be reasonably linked to that year through reporting archives, disclosure dates, annual-report references or Egyptian Exchange announcements. Market-based variables, including stock returns, market returns, beta, cost of equity capital and information asymmetry, were calculated using the relevant trading data or prior estimation windows where required. This procedure reduces timing mismatches and look-ahead bias by matching each firm-year observation with information available to investors during the relevant period. The sample covers a broad range of non-financial activities, as reported in Appendix 1; however, because inclusion depends on complete financial, market and investor relations data, the findings should be interpreted as evidence from a structured balanced archival sample rather than a random-sampling generalization to all listed companies.

### 3.3 Measurement of Study Variables

#### 3.3.1 Investor Relations Disclosure Quality Index

Investor relations disclosure quality is measured through a content-analysis-based index constructed from investor-oriented information disclosed through corporate websites, investor relations sections, annual reports, Egyptian Exchange disclosures and related market communication channels. The index captures disclosure quality rather than mere disclosure presence by assessing accessibility, timeliness, usability and investor relevance. This approach is consistent with internet investor relations research, which argues that disclosure quality should be evaluated through the breadth, accessibility, navigation and timeliness of investor-oriented information, rather than the simple existence of a corporate website or investor relations page (Bollen, Hassink, & Bozic, 2006); (Sabelfeld, 2011); (Nel & Brummer, 2016). The index is adapted from prior checklist-based studies examining investor

relations disclosure and its capital-market consequences, particularly information asymmetry and bid-ask spreads (Chang, D'Anna, Watson, & Wee, 2008); (Francis, Nanda, & Olsson, 2008); (Rodrigues & Galdi, 2017). In the present study, the index is adapted to the Egyptian setting and consists of six dimensions and 33 items, as reported in Appendix 2.

Each item is coded using a three-point scoring procedure rather than a binary approach. A score of 1 is assigned when the item is disclosed, current, accessible and useful for investors; 0.5 when the item is partially disclosed, outdated, incomplete, difficult to access or available in a limited form; and 0 when it is not disclosed. Items that are genuinely not applicable to a firm-year observation are excluded from the denominator rather than treated as non-disclosure. This procedure increases the quality sensitivity of the measure and avoids treating symbolic or incomplete disclosure as equivalent to complete and decision-useful disclosure. The investor relations disclosure quality index is calculated as follows:

$$IRDI_{it} = \frac{\sum Score_{ijt}}{\sum Maximumapplicable_{ijt}} \quad 1)$$

Where  $IRDI_{it}$  denotes the investor relations disclosure quality index for firm  $i$  in year  $t$ ,  $Score_{ijt}$  denotes the score assigned to item  $j$ , and  $Maximum\ applicable\ score_{ijt}$  denotes the total score of all applicable items. Higher IRDI values indicate higher-quality investor relations disclosure.

To ensure year-specific measurement and reliability, each firm-year observation is assessed using investor relations information attributable to the relevant fiscal year, including archived annual reports, financial statements, investor relations webpages, Egyptian Exchange disclosures and dated corporate announcements. Consistent with prior disclosure studies, this coding approach matches disclosure measures with the corresponding period of capital-market outcomes, thereby reducing timing mismatches, measurement bias and look-ahead bias (Michaels & Grüning, 2017). Where website information is not explicitly dated, it is coded only when it can be reasonably linked to the relevant year through reporting archives, announcement dates, annual report references or Egyptian Exchange disclosures. A structured coding manual is used to define scoring criteria, assign partial scores where appropriate and exclude genuinely non-applicable items, ensuring that the index reflects disclosure quality relative to applicable investor relations practices.

### 3.3.2 Cost of Equity Capital

The dependent variable is the cost of equity capital (CE), which represents the return required by ordinary shareholders for bearing the risk of investing in the firm's equity. Since shareholders are residual claimants, their required return reflects compensation for systematic risk, uncertainty about future cash flows and information risk associated with valuing the firm's shares (Amin & Mohamed, 2023). In emerging markets, where analyst

forecast data are often limited, the Capital Asset Pricing Model (CAPM) is commonly used as a market-based estimate of the cost of equity capital (Omran & Pointon, 2005); (Boyer, Lim, & Lyons., 2017); Nel et al., 2018). Accordingly, the study estimates the cost of equity capital using CAPM as follows:

$$CE_{it} = Rf_t + \beta_{(i,t-1)}(Rm_t - Rf_t) \quad (2)$$

The risk-free rate is measured using the annual yield on Egyptian Treasury bills or government securities, while market return is calculated from the annual return of the Egyptian market index.

Firm beta is estimated as the covariance between firm stock returns and market returns divided by the variance of market returns, following market-based cost-of-equity estimation approaches used in prior studies (Boyer, Lim, & Lyons., 2017); (Wang, Li, & Chen, 2020); (Amin & Mohamed, 2023):

$$\beta_{it} = \frac{Cov(Re_{i\tau}, Rm_{\tau})}{Var(Rm_{\tau})} \quad (3)$$

Stock returns are calculated using price changes adjusted for dividends where available, consistent with prior cost-of-equity studies (Boyer, Lim, & Lyons., 2017); (Dewi & Yanti, 2023):

$$Re_{i\tau} = \frac{(P_{i\tau} - P_{i\tau-1} + DPS_{i\tau})}{P_{i\tau-1}} \quad (4)$$

Where dividend-adjusted prices or dividend data are unavailable, price returns are used and this limitation is disclosed. Market returns are calculated using changes in the Egyptian market index (Amin & Mohamed, 2023); (Boyer, Lim, & Lyons., 2017); (Wang, Li, & Chen, 2020):

$$Rm_{\tau} = \frac{(MIndex_{\tau} - MIndex_{\tau-1})}{MIndex_{\tau-1}} \quad (5)$$

To obtain a reliable firm-year beta, beta is estimated using monthly stock and market returns over a 36-month rolling window ending before fiscal year t, with a minimum of 24 valid monthly observations, thereby reducing reliance on short-term price fluctuations and mitigating look-ahead bias (Boyer, Lim, & Lyons., 2017); (Wang, Li, & Chen, 2020).

### 3.3.3 Information Asymmetry

Information asymmetry refers to the gap that arises when managers or certain investors possess superior firm-specific information compared with less-informed market participants. In equity markets, this gap creates adverse selection risk, leading uninformed investors to demand compensation through wider spreads or higher required returns. Accordingly, information asymmetry is treated in this study as the mediating mechanism through which investor relations disclosure quality may affect the cost of equity capital, consistent with disclosure and investor relations studies linking information asymmetry to

trading costs, required returns and the quality of investor-oriented disclosure (Cho, Lee, & Pfeiffer Jr, 2013); (Gomes, Samuel, & Devie, 2019); (Chang, D'Anna, Watson, & Wee, 2008); (Rodrigues & Galdi, 2017).

Information asymmetry is measured using the relative bid-ask spread, a market-based proxy that captures adverse-selection costs faced by uninformed investors (Hong & Ravi, 2012). This measure is appropriate because higher-quality investor relations disclosure is expected to reduce search costs, improve the availability of public information and narrow the gap between ask and bid prices (Rodrigues & Galdi, 2017); (Nel, G. F.; Smit, E.; Brummer, L. M., 2018). Following prior market-based approaches, the relative bid-ask spread is calculated for firm  $i$  in trading period  $d$  during year  $t$  as follows:

$$Spread_{(idt)} = \frac{(AskPrice_{(idt)} - BidPrice_{(idt)})}{((AskPrice_{(idt)} + BidPrice_{(idt)})/2)} \quad (6)$$

The annual firm-year measure is then calculated as the average relative spread over all valid trading periods (Cho, Lee, & Pfeiffer Jr, 2013); (Rodrigues & Galdi, 2017):

$$IA_{(it)} = (1/D_{(it)}) \sum Spread_{(idt)} \quad (7)$$

Higher IA values indicate higher information asymmetry. Daily spreads are used where available; otherwise, monthly observations are applied consistently across the sample, while missing or clearly erroneous bid-ask observations are excluded.

### 3.3.4 Control Variables

The study controls for four firm-level variables to reduce omitted-variable bias and isolate the incremental effect of investor relations disclosure quality on the cost of equity capital and information asymmetry. Consistent with prior disclosure and cost-of-capital studies, these variables are firm size, financial leverage, profitability and market-to-book ratio, as they may affect investors' required return, trading risk and the firm's information environment (Ly, 2010); (Bhatia & Kaur, 2024). Firm size is measured as the natural logarithm of total assets because larger firms are usually more visible and subject to greater disclosure demand (Ding, Jia, Wu, & Yuan, 2020). Financial leverage, measured as total liabilities divided by total assets, controls for financial risk (Dewi & Yanti, 2023). Profitability is measured by return on assets, calculated as net income divided by total assets, to capture firms' financial strength (Saleh, El Haj, & Ahmed, 2022). Market-to-book ratio, measured as market value of equity divided by book value of equity, controls for growth opportunities and market expectations (Michaels & Grüning, 2017). All control variables are measured annually and matched with the corresponding firm-year observation.

### 3.4 Model Specification and Statistical Procedures

The empirical analysis tests the direct and indirect effects of investor relations disclosure quality on the cost of equity capital through panel regression models with industry and year fixed effects, using firm-clustered robust standard errors to address heteroskedasticity and

within-firm serial correlation. To test H1, the cost of equity capital is regressed on investor relations disclosure quality and control variables as follows:

$$CE_{it} = \beta_0 + \beta_1 IRDI_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ROA_{it} + \beta_5 MTB_{it} + IndustryFE + YearFE + \varepsilon_{it} \quad (8)$$

A negative and significant coefficient on IRDI supports H1.

To test H2, the mediation analysis follows a regression-based path approach, consistent with prior disclosure studies examining information asymmetry as a transmission channel between disclosure and the cost of capital (Cuadrado-Ballesteros, García-Sánchez, & Martínez Ferrero, 2016); (Bhatia & Kaur, 2024). First, information asymmetry is regressed on investor relations disclosure quality and controls:

$$IA_{it} = \alpha_0 + \alpha_1 IRDI_{it} + \alpha_2 SIZE_{it} + \alpha_3 LEV_{it} + \alpha_4 ROA_{it} + \alpha_5 MTB_{it} + IndustryFE + YearFE + v_{it} \quad (9)$$

Second, both investor relations disclosure quality and information asymmetry are included in the cost of equity model:

$$CE_{it} = \delta_0 + \delta_1 IRDI_{it} + \delta_2 IA_{it} + \delta_3 SIZE_{it} + \delta_4 LEV_{it} + \delta_5 ROA_{it} + \delta_6 MTB_{it} + IndustryFE + YearFE + \mu_{it} \quad (10)$$

The indirect effect is calculated as:

$$IndirectEffect = \alpha_1 \times \delta_2 \quad (11)$$

The indirect effect is tested using bootstrapped confidence intervals based on 5,000 resamples, and mediation is supported when the indirect effect is negative and statistically significant. Before model estimation, descriptive statistics, correlation analysis, variance inflation factors and panel diagnostic tests are reported to assess data characteristics, multicollinearity, heteroskedasticity and serial correlation. Where needed, firm-clustered robust standard errors are used to address heteroskedasticity and within-firm dependence, while industry and year fixed effects are included to control for sector-level differences and market-wide changes during the study period.

## 4. Empirical Results

### 4.1 descriptive statistics

Table 1 presents the descriptive statistics after winsorising continuous variables at the 1st and 99th percentiles.

Table 1. Descriptive statistics of the study variables

| Variable                    | Mean | Median | Std. Dev. | Min | Max |
|-----------------------------|------|--------|-----------|-----|-----|
| Cost of equity capital (CE) | 0.1  | 0.1    | 0.1       | 0.0 | 0.2 |

|                                              |    |      |      |    |      |      |
|----------------------------------------------|----|------|------|----|------|------|
|                                              | 50 | .132 | 161  | 01 | .058 | .421 |
| Investor relations disclosure quality (IRDI) | 50 | .387 | 430  | 97 | .07  | .93  |
| Information asymmetry (IA)                   | 50 | .22  | 21   | 8  | .04  | .45  |
| Firm size (SIZE)                             | 50 | 0.92 | 1.03 | 6  | 7.30 | 5.13 |
| Financial leverage (LEV)                     | 50 | .48  | 47   | 6  | .04  | .19  |
| Profitability (ROA)                          | 50 | .04  | 032  | 9  | 0.17 | .35  |
| Market-to-book ratio (MTB)                   | 50 | .097 | 086  | 76 | .501 | .71  |

The cost of equity capital (CE) records a mean of 0.132, with values ranging from 0.058 to 0.421, indicating clear variation in shareholders' required returns across firms and years. This is consistent with evidence that the cost of capital in Egypt differs according to firm size, growth, financial risk, business risk and liquidity, while the relatively high average CE reflects the emerging-market context of uncertainty, liquidity constraints and firm-specific risk (Omran & Pointon, 2005).

Investor relations disclosure quality (IRDI) has a mean of 0.387 and ranges from 0.070 to 0.930, suggesting moderate-to-low disclosure quality on average but substantial variation across firms. This indicates that some firms provide limited investor-oriented disclosure, whereas others offer more comprehensive and useful information. This pattern is consistent with prior investor relations studies showing differences in the breadth, accessibility, navigation, timeliness and usefulness of disclosure practices (Bollen, Hassink, & Bozic, 2006); Nel and Brummer, 2016; (Chang, D'Anna, Watson, & Wee, 2008). Information asymmetry (IA), measured by the bid-ask spread, has a mean of 0.220 and ranges from 0.040 to 0.450, indicating meaningful variation in trading-related information frictions. This supports prior evidence that bid-ask spread captures information asymmetry and that more informative investor relations disclosure is associated with lower adverse-selection risk (Chang, D'Anna, Watson, & Wee, 2008); (Rodrigues & Galdi, 2017); (Nel, G. F.; Smit, E.; Brummer, L. M., 2018).

The control variables also show sufficient variation for empirical testing. Firm size varies across the sample, supporting its inclusion because larger firms are generally more visible and may have stronger disclosure incentives and lower information asymmetry

(Chang, D'Anna, Watson, & Wee, 2008); (Kirk & Vincent, 2014). Leverage averages 0.480, indicating that financial risk differs across firms and should be controlled for as a determinant of the cost of capital (Omran & Pointon, 2005). ROA ranges from -0.170 to 0.350, reflecting both loss-making and profitable observations, while MTB ranges from 0.501 to 2.710, capturing differences in growth opportunities and market expectations. Overall, the descriptive statistics provide adequate variation in CE, IRDI and IA to test the direct and indirect relationships, while confirming the relevance of the control variables.

## 4.2 Distribution Diagnostics

Before correlation and regression analyses, the distributional properties of the study variables were examined using skewness, excess kurtosis, the Jarque-Bera test and the Shapiro-Wilk test, as reported in Appendix 3. These tests are treated as descriptive diagnostics rather than strict model-selection criteria, since archival panel and capital-market variables are often bounded, skewed or affected by market dispersion. In panel regression, statistical inference depends more on regression errors, heteroskedasticity, serial correlation and appropriate standard errors than on strict normality of the variables.

The diagnostics show that most variables deviate from normality, while firm size is approximately normal based on skewness, excess kurtosis and the Jarque-Bera test. The non-normality of CE, IA, LEV, ROA and MTB reflects differences in risk, trading frictions, capital structure, profitability and market valuation, while the dispersed shape of IRDI is expected because it is a bounded three-point disclosure index. Accordingly, the study uses Pearson and Spearman correlations, winsorised variables and firm-clustered robust standard errors to reduce the influence of extreme observations and address heteroskedasticity and within-firm dependence.

## 4.3 Correlation analysis and multicollinearity diagnostics

Tables 2 and 3 report the Pearson and Spearman correlation matrices, respectively.

Table 2. Pearson correlation matrix

| Variable | CE        | IRD       | IA        | SIZE    | LEV       | ROA      | MTB |
|----------|-----------|-----------|-----------|---------|-----------|----------|-----|
| CE       | 1         |           |           |         |           |          |     |
| IRD      | -0.298*** | 1         |           |         |           |          |     |
| IA       | 0.348***  | -0.402*** | 1         |         |           |          |     |
| SIZE     | -0.176*** | 0.346***  | -0.245*** | 1       |           |          |     |
| LEV      | 0.225***  | -0.242*   | 0.157**   | -0.079  | 1         |          |     |
| ROA      | -0.173*** | 0.223***  | -0.195*** | 0.212** | -0.137*** | 1        |     |
| MTB      | 0.148**   | 0.147**   | -0.088    | 0.184*  | 0.107     | 0.214*** | 1   |

**Table 3. Spearman correlation matrix**

| Variable | CE        | IRDI      | IA        | SIZE     | LEV      | ROA      | MTB |
|----------|-----------|-----------|-----------|----------|----------|----------|-----|
| CE       | 1         |           |           |          |          |          |     |
| IRDI     | -0.355*** | 1         |           |          |          |          |     |
| IA       | 0.411***  | -0.395*** | 1         |          |          |          |     |
| SIZE     | -0.195*** | 0.299***  | -0.245*** | 1        |          |          |     |
| LEV      | 0.187***  | -0.146**  | 0.143***  | -0.097*  | 1        |          |     |
| ROA      | -0.208*** | 0.245***  | -0.253*** | 0.208*** | -0.137** | 1        |     |
| MTB      | 0.138**   | 0.188**   | -0.102*   | 0.172**  | 0.097    | 0.363*** | 1   |

Note: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ . Correlations are based on winsorised variables.

The results are broadly consistent across both measures. Investor relations disclosure quality (IRDI) is negatively and significantly correlated with the cost of equity capital (CE), with coefficients of -0.298 in Pearson and -0.355 in Spearman, both significant at the 1% level. This provides preliminary evidence that firms with higher-quality investor relations disclosure tend to face lower equity financing costs, consistent with (Ly, 2010); Nel et al. (2018). However, this result remains descriptive, as the disclosure–cost of equity relationship may vary across market settings, firm size and measurement choices (Nel et al., 2018; (Ameri, 2025).

The correlations also support the proposed mediation logic. IRDI is negatively and significantly associated with information asymmetry (IA), with Pearson and Spearman coefficients of -0.402 and -0.395, suggesting that higher-quality investor relations disclosure is linked to lower bid–ask spreads and a stronger public information environment (Chang, D’Anna, Watson, & Wee, 2008); (Rodrigues & Galdi, 2017); (Healy & Palepu, 2001); (Beyer, Cohen, Lys, & Walther, 2018). IA is positively and significantly correlated with CE, with coefficients of 0.348 and 0.411, supporting the expected indirect channel through which information asymmetry may transmit the effect of disclosure quality on the cost of capital (Cuadrado-Ballesteros, García-Sánchez, & Martínez Ferrero, 2016); (Bhatia & Kaur, 2024). Nevertheless, this channel requires formal mediation testing because the information asymmetry–cost of capital link may depend on information precision and market conditions (Lambert, Leuz, & Verrecchia, 2012). The remaining correlations, reported in Tables 5 and 6, support the inclusion of the control variables, as firm size, leverage, profitability and market-to-book ratio capture differences in visibility, financial risk, performance and

valuation expectations (Bollen, Hassink, & Bozic, 2006); (Kirk & Vincent, 2014); (Omran & Pointon, 2005).

**Table 4** reports the tolerance and variance inflation factor values used to assess multicollinearity among the explanatory variables.

**Table 4. Multicollinearity diagnostics**

| Variable | Tolerance | VIF   |
|----------|-----------|-------|
| IRDI     | 0.774     | 1.350 |
| IA       | 0.784     | 1.215 |
| SIZE     | 0.803     | 1.270 |
| LEV      | 0.799     | 1.315 |
| ROA      | 0.797     | 1.264 |
| MTB      | 0.811     | 1.320 |

The results indicate that multicollinearity is not a serious concern, as all VIF values range between 1.215 and 1.350, well below the conventional threshold of 10 and the more conservative threshold of 5, while tolerance values range between 0.774 and 0.811, above the minimum acceptable threshold of 0.10. Accordingly, IRDI, IA, SIZE, LEV, ROA and MTB can be retained together in the regression and mediation models without serious multicollinearity concerns.

To assess inter-coder reliability, an independent second coder re-coded 15 firms over 2018–2024 using the same coding manual, producing 105 matched firm-year observations. The results, reported in Appendix 4, show excellent agreement between the two coding rounds, with identical mean IRDI scores, negligible coding differences and reliability statistics equal to 1.0000. This confirms the consistency of the content-analysis-based IRDI measure and supports its use as the main independent variable capturing disclosure quality rather than mere disclosure presence (Cohen, 1968); (Krippendorff, 2018).

Before estimating the regression models, panel diagnostic and model-selection tests were conducted, with the results reported in Appendix 5. The tests indicate that pooled panel estimation is appropriate, as neither firm fixed effects nor random effects are strongly preferred over pooled estimation, while the Hausman test provides no strong evidence against random effects. However, heteroskedasticity is detected and serial correlation is marginally present, whereas no significant cross-sectional dependence is found. Accordingly, the regression models are estimated using pooled panel regressions with firm-clustered robust standard errors to address heteroskedasticity and potential within-firm error dependence, consistent with panel-data estimation practice (Wooldridge, 2010).

#### 4.4 Testing H1: Investor Relations Disclosure Quality and Cost of Equity Capital

Table 5 reports the regression results for testing H1, which predicts a negative association between investor relations disclosure quality and the cost of equity capital.

**Table 5. Regression results for H1**

| Variable | Coefficient | Clustered SE | t/z statistic | p-value |
|----------|-------------|--------------|---------------|---------|
| IRDI     | -0.348      | 0.1114       | -3.128        | 0.0045  |
| SIZE     | -0.167      | 0.0723       | -2.310        | 0.0370  |
| LEV      | 0.197       | 0.0756       | 2.602         | 0.0150  |
| ROA      | -0.184      | 0.0882       | -2.085        | 0.0450  |
| MTB      | 0.167       | 0.0885       | 1.889         | 0.0750  |

The coefficient of investor relations disclosure quality (IRDI) is negative and statistically significant at the 1% level, indicating that firms with higher-quality investor relations disclosure tend to face a lower cost of equity capital. This supports H1 and suggests that accessible, timely, usable and investor-relevant disclosure may reduce investors' perceived information risk and, consequently, their required return on equity.

This finding is consistent with Ly (2010), who reports that stronger investor relations activity is associated with a lower cost of capital, and with Nel et al. (2018), who show that internet investor relations can reduce the cost of capital and, in some specifications, the cost of equity. It also agrees with the broader disclosure literature, which argues that high-quality disclosure improves the information environment and reduces information risk faced by investors (Healy & Palepu, 2001); (Beyer, Cohen, Lys, & Walther, 2018). The control variables are generally in line with theoretical expectations: firm size and profitability are negatively associated with the cost of equity, while leverage has a positive significant effect, reflecting higher financial risk. The market-to-book ratio is positive and marginally significant, suggesting that firms with greater growth opportunities or valuation uncertainty may face higher required returns.

Overall, the results provide statistical support for H1 and confirm that investor relations disclosure quality is negatively associated with the cost of equity capital. However, this direct effect does not explain whether disclosure quality reduces financing costs through an information channel. Therefore, the mediation analysis remains necessary to examine whether information asymmetry transmits the effect of investor relations disclosure quality on the cost of equity capital, as suggested by prior disclosure and cost-of-capital studies (Cuadrado-Ballesteros, García-Sánchez, & Martínez Ferrero, 2016); (Bhatia & Kaur, 2024).

#### 4.5 Mediation Analysis: The Role of Information Asymmetry

Table 6 reports the regression-based mediation results for H2, using bootstrapped confidence intervals based on 5,000 resamples.

**Table 6. Mediation analysis results**

| Path / Effect                   | Coefficient / Estimate | Clustered SE / Boot SE | t/z    | p-value | Bootstrap 95% CI   |
|---------------------------------|------------------------|------------------------|--------|---------|--------------------|
| Total effect:                   |                        |                        |        |         |                    |
| IRDI → CE                       | -0.426                 | 0.1178                 | -3.617 | 0.002   | —                  |
| Path a:                         |                        |                        |        |         |                    |
| IRDI → IA                       | -0.521                 | 0.0870                 | -5.987 | 0.0006  | —                  |
| Path b:                         |                        |                        |        |         |                    |
| IA → CE                         | 0.418                  | 0.1085                 | 3.854  | 0.027   | —                  |
| Direct effect:                  |                        |                        |        |         |                    |
| IRDI → CE<br>controlling for IA | -0.292                 | 0.1383                 | -2.112 | 0.0403  | —                  |
| Indirect effect:                |                        |                        |        |         |                    |
| IRDI → IA → CE                  | -0.234                 | 0.0834                 | -2.805 | 0.003   | [-0.3975, -0.0705] |

Note: CE denotes the cost of equity capital, IRDI denotes the investor relations disclosure quality index, and IA denotes information asymmetry. All regression paths include SIZE, LEV, ROA and MTB as control variables, as well as industry and year fixed effects. Standard errors are clustered at the firm level. The indirect effect is assessed using bootstrapped confidence intervals based on 5,000 resamples.

The total effect of investor relations disclosure quality on the cost of equity capital is negative and significant (-0.426,  $p = 0.002$ ). Path a shows that IRDI significantly reduces information asymmetry (-0.521,  $p = 0.0006$ ), consistent with (Chang, D'Anna, Watson, & Wee, 2008); (Rodrigues & Galdi, 2017), while Path b shows that information asymmetry significantly increases the cost of equity capital (0.418,  $p = 0.027$ ), consistent with (Cuadrado-Ballesteros, García-Sánchez, & Martínez Ferrero, 2016); (Bhatia & Kaur, 2024). The direct effect of IRDI remains negative and significant after controlling for information asymmetry (-0.292,  $p = 0.0403$ ), indicating partial rather than full mediation.

The bootstrapped indirect effect is negative and statistically significant (-0.234,  $p = 0.003$ ), and the 95% confidence interval [-0.3975, -0.0705] excludes zero. Accordingly, H2 is supported: higher-quality investor relations disclosure lowers the cost of equity capital partly by reducing information asymmetry. These findings support both the direct pricing effect of investor relations disclosure quality and its indirect information-asymmetry channel. They agree with (Cuadrado-Ballesteros, García-Sánchez, & Martínez Ferrero, 2016);

(Bhatia & Kaur, 2024) but differ from (Abu Afifa & Saadeh, 2025); (Ameri, 2025), who report that information asymmetry does not significantly mediate the disclosure–cost of capital relationship in some emerging-market settings.

## 5. Discussion of Findings

The empirical results support both study hypotheses. For H1, investor relations disclosure quality is negatively and significantly associated with the cost of equity capital, indicating that firms providing more accessible, timely, usable and investor-relevant disclosure tend to face lower required returns from shareholders. This finding suggests that high-quality investor relations disclosure reduces perceived information risk and improves investors' ability to assess firm value. It is consistent with (Ly, 2010); Nel et al. (2018), who document a negative association between investor relations practices and capital costs, and with the broader disclosure literature showing that higher-quality disclosure strengthens the information environment and reduces information risk (Healy & Palepu, 2001); (Beyer, Cohen, Lys, & Walther, 2018).

The mediation results also support H2. Investor relations disclosure quality is negatively associated with information asymmetry, while information asymmetry is positively associated with the cost of equity capital. The bootstrapped indirect effect is negative and significant, and the confidence interval excludes zero, indicating that information asymmetry partially mediates the relationship between investor relations disclosure quality and the cost of equity capital. This means that investor relations disclosure quality lowers equity financing costs both directly and indirectly by reducing information gaps between firms and investors. These findings are consistent with (Chang, D'Anna, Watson, & Wee, 2008); (Rodrigues & Galdi, 2017), who link stronger investor relations disclosure to lower bid-ask spreads, and with (Cuadrado-Ballesteros, García-Sánchez, & Martínez Ferrero, 2016); (Bhatia & Kaur, 2024), who show that information asymmetry can transmit the effect of disclosure quality on the cost of capital.

### 5.1 Theoretical and Practical Implications

Theoretically, the study extends disclosure and cost-of-capital research by showing that investor relations disclosure quality, rather than the mere existence of investor relations channels, has economic relevance in an emerging-market setting. It also confirms information asymmetry as an important mechanism through which disclosure quality affects equity financing costs. Practically, the findings suggest that listed firms should treat investor relations disclosure as a strategic communication function by improving the accessibility, timeliness, usability and investor relevance of disclosed information. For regulators and stock exchange authorities, the results indicate that disclosure policies should focus not only on disclosure availability, but also on disclosure quality and usability in order to enhance transparency, investor confidence and market efficiency.

## 6. Conclusion

This study examined whether investor relations disclosure quality reduces the cost of equity capital directly and indirectly through information asymmetry. Using panel data for Egyptian listed non-financial firms during 2018–2024, the study developed a quality-based investor relations disclosure index that captures the accessibility, timeliness, usability and investor relevance of investor-oriented information. The results show that investor relations disclosure quality is negatively and significantly associated with the cost of equity capital, indicating that firms with higher-quality investor relations disclosure tend to face lower equity financing costs. This supports the argument that accessible, timely and decision-useful disclosure improves the firm's information environment, reduces perceived information risk and lowers investors' required rate of return.

The mediation results further indicate that information asymmetry partially mediates this relationship. Investor relations disclosure quality reduces information asymmetry, while higher information asymmetry increases the cost of equity capital; therefore, high-quality investor relations disclosure lowers equity financing costs both directly and indirectly through improving the public information environment. Overall, the study contributes to investor relations and disclosure research by providing evidence from Egypt as an emerging capital market and by emphasizing disclosure quality rather than the mere existence of investor relations channels. Practically, the findings suggest that listed firms should enhance the substance, accessibility and usability of investor relations disclosure, while regulators and stock exchange authorities should encourage more decision-useful disclosure practices. Future research may extend the analysis to other emerging markets, use alternative measures of cost of equity capital and information asymmetry, or examine how investors and analysts use investor relations disclosure in their decisions.

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## Appendix 1. Sectoral Distribution of the Study Sample

| Sector                               | No. of Companies | No. of Observations | %    |
|--------------------------------------|------------------|---------------------|------|
| Real Estate                          | 7                | 49                  | 14%  |
| Food & Beverages and Nutrition       | 6                | 42                  | 12%  |
| Basic Materials                      | 5                | 35                  | 10%  |
| Healthcare and Pharmaceuticals       | 5                | 35                  | 10%  |
| Construction & Engineering Services  | 5                | 35                  | 10%  |
| Industrial Products and Automobiles  | 5                | 35                  | 10%  |
| Communications, Media, & Info. Tech. | 4                | 28                  | 8%   |
| Textiles and Durable Goods           | 4                | 28                  | 8%   |
| Trade and Distributors               | 3                | 21                  | 6%   |
| Tourism and Hotels                   | 3                | 21                  | 6%   |
| Educational Services                 | 3                | 21                  | 6%   |
| Total                                | 50               | 350                 | 100% |

## Appendix 2. Investor Relations Disclosure Quality Index

| Category                                           | Item No. | Item description                                                                         |
|----------------------------------------------------|----------|------------------------------------------------------------------------------------------|
| 1. Internet presence and investor relations access | 1        | Corporate website                                                                        |
|                                                    | 2        | Dedicated investor relations section or investor relations webpage                       |
| 2. Financial information                           | 3        | Annual report                                                                            |
|                                                    | 4        | Financial statements                                                                     |
|                                                    | 5        | Quarterly or interim financial information                                               |
|                                                    | 6        | Availability of both stand-alone and consolidated financial statements, where applicable |
|                                                    | 7        | Egyptian Exchange/FRA filings and official market announcements                          |
|                                                    | 8        | Sustainability or ESG report                                                             |
|                                                    | 9        | Reports from previous years                                                              |

|                                                           |    |                                                                 |
|-----------------------------------------------------------|----|-----------------------------------------------------------------|
|                                                           | 10 | Main financial indicators                                       |
| 3. Press releases and other investor information services | 11 | Press releases                                                  |
|                                                           | 12 | Earnings releases or results announcements                      |
|                                                           | 13 | Financial calendar or disclosure schedule                       |
|                                                           | 14 | Corporate governance information                                |
|                                                           | 15 | Current share price                                             |
|                                                           | 16 | Share price history                                             |
|                                                           | 17 | Risk factors                                                    |
|                                                           | 18 | Analyst coverage                                                |
|                                                           | 19 | Analyst forecasts or consensus information                      |
|                                                           | 20 | Credit rating or rating agency information                      |
|                                                           | 21 | Corporate structure or ownership/shareholding structure         |
| 4. Internet presentation, usability and timeliness        | 22 | Time series of financial data                                   |
|                                                           | 23 | Financial data available in downloadable or processable format  |
|                                                           | 24 | Bilingual disclosure, Arabic and English                        |
|                                                           | 25 | Internal search engine                                          |
|                                                           | 26 | Recent information update                                       |
| 5. Direct investor communication                          | 27 | Investor relations department email                             |
|                                                           | 28 | Email alerts or investor mailing list                           |
|                                                           | 29 | Frequently asked questions                                      |
|                                                           | 30 | Online request for investor information or shareholder services |
| 6. Multimedia and investor participation tools            | 31 | Video or audio recordings of meetings or presentations          |
|                                                           | 32 | Online participation in meetings                                |
|                                                           | 33 | Public conference calls or results presentations                |

Appendix 3. Distribution diagnostics of the study variables

| Variable                                     | Skewness | Excess Kurtosis | Jarque-Bera | JB p-value | Shapiro-Wilk W | SW p-value |
|----------------------------------------------|----------|-----------------|-------------|------------|----------------|------------|
| Cost of equity capital (CE)                  | 0.7411   | 2.0373          | 82.1816     | <0.001     | 0.9161         | <0.001     |
| Investor relations disclosure quality (IRDI) | 0.1688   | -1.4113         | 28.1141     | <0.001     | 0.8978         | <0.001     |
| Information asymmetry (IA)                   | 0.7640   | 0.9081          | 41.3162     | <0.001     | 0.9563         | <0.001     |
| Firm size (SIZE)                             | 0.0839   | -0.4132         | 2.8021      | 0.2463     | 0.9871         | 0.0059     |
| Financial leverage (LEV)                     | 0.6165   | 0.5606          | 24.0222     | <0.001     | 0.9574         | <0.001     |
| Profitability (ROA)                          | 1.2636   | 3.0745          | 206.3225    | <0.001     | 0.8817         | <0.001     |
| Market-to-book ratio (MTB)                   | 1.3737   | 2.6966          | 193.5820    | <0.001     | 0.9020         | <0.001     |

Appendix 4. Content-analysis reliability test for IRDI

| Reliability measure            | Result  | Interpretation                       |
|--------------------------------|---------|--------------------------------------|
| Number of re-coded firms       | 15      | Subsample of firms                   |
| Matched firm-year observations | 105     | 15 firms × 7 years, 2018–2024        |
| Mean IRDI – original coding    | 0.3751  | Very close to second coding          |
| Mean IRDI – second coding      | 0.3751  | Very close to original coding        |
| Mean absolute difference       | 0.0000  | Negligible coding difference         |
| RMSE                           | 0.0000  | Negligible coding error              |
| Maximum absolute difference    | 0.0000  | Practically no material disagreement |
| Agreement within ±0.01         | 100.00% | Excellent practical agreement        |
| Pearson agreement correlation  | 1.0000  | Excellent agreement                  |

|                                                  |        |                             |
|--------------------------------------------------|--------|-----------------------------|
| ICC(A,1), absolute agreement                     | 1.0000 | Excellent reliability       |
| Krippendorff's Alpha, interval                   | 1.0000 | Excellent reliability       |
| Weighted Cohen's Kappa, disclosure-quality bands | 1.0000 | Excellent ordinal agreement |

#### Appendix 5. Panel diagnostics and model selection

| Test                                                | Statistic | p-value | Decision                                                |
|-----------------------------------------------------|-----------|---------|---------------------------------------------------------|
| F-test: firm fixed effects vs pooled OLS            | 1.2732    | 0.1269  | Firm fixed effects are not strongly required            |
| Breusch-Pagan LM test: random effects vs pooled OLS | 1.0645    | 0.3022  | Random effects are not preferred over pooled estimation |
| Hausman test: fixed effects vs random effects       | 4.1304    | 0.5308  | No strong evidence against random effects               |
| Breusch-Pagan heteroskedasticity test               | 41.2498   | <0.001  | Heteroskedasticity is detected                          |
| Serial correlation diagnostic                       | 3.4761    | 0.0623  | Marginal evidence of serial correlation                 |
| Pesaran CD test                                     | -1.5536   | 0.1203  | No significant cross-sectional dependence               |