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## **Direct and Joint Effects of Earnings Quality and Integrated Reporting on the Cost of Capital**

### **Abstract**

Integrated reporting is a new tool of reporting that makes financial reporting more comprehensive and transparent by incorporating financial and non-financial information in one report. Although integrated reporting has gained more attention from the academic perspective in the last few years, only few studies have focused on the relationship between integrated reporting, and the cost of capital. Moreover, according to the researcher's knowledge, the contributions of the joint effect of earnings quality and the integrated reporting on the cost of capital are rare. Hence, this study examines the direct and joint effects of earnings quality and integrated reporting on the cost of capital for a sample of 81 companies listed on the EGX 100 with 324 observations for the period 2016–2019. The results show that higher earnings quality decreases the cost of debt and cost of capital. Further, the examination shows a significant negative association between integrated reporting and both the cost of equity and cost of capital. Additionally, the relationship between earnings quality and cost of capital and the association between integrated reporting and cost of debt do not support the research hypotheses. Finally, companies with higher earnings quality and integrated reporting bear a lower cost of capital.

**Keywords:** Earnings quality, Integrated reporting, cost of debt, cost of equity, Cost of capital.

## الأثر المباشر والمشارك لإدارة الأرباح والتقارير المتكاملة على تكلفة رأس المال

### ملخص البحث

تعد التقارير المتكاملة أداة جديدة لإعداد التقارير المالية من خلال جعل التقارير المالية أكثر شمولاً وشفافية وذلك من خلال دمج المعلومات المالية وغير المالية في تقرير واحد. ونظراً للاهتمام المتزايد بالتقارير المتكاملة في السنوات القليلة الماضية، إلا أن هناك ندرة في الدراسات التي تناولت العلاقة بين التقارير المتكاملة وتكلفة رأس المال. وعلاوة على ذلك، وفي حدود علم الباحثة، فإن هناك ندرة في الدراسات التي تناولت الأثر المشترك لجودة الأرباح والتقارير المتكاملة على تكلفة رأس المال. ولذلك هدفت الدراسة إلى اختبار الأثر المباشر والمشارك لجودة الأرباح والتقارير المتكاملة على تكلفة رأس المال وذلك لعينة مكونة من 324 مشاهدة لعدد من 81 شركة مدرجة في مؤشر EGX 100 وذلك عن الفترة من 2016 إلى 2019. وقد أشارت النتائج إلى وجود علاقة سلبية بين جودة الأرباح وكلاً من تكلفة التمويل بالاقتراض وتكلفة رأس المال، ووجود علاقة سلبية بين التقارير المتكاملة وكلاً من تكلفة التمويل بالملكية وتكلفة رأس المال، فضلاً عن عدم وجود علاقة معنوية بين جودة الأرباح وتكلفة رأس المال من ناحية، ومن ناحية أخرى عدم وجود علاقة معنوية بين التقارير المتكاملة وتكلفة التمويل بالاقتراض. وأخيراً، انخفاض تكلفة رأس المال بالنسبة للشركات التي لديها جودة أرباح مرتفعة وتقارير متكاملة.

**الكلمات المفتاحية:** إدارة الأرباح، التقارير المتكاملة، تكلفة التمويل بالاقتراض، تكلفة التمويل بالملكية، تكلفة رأس المال.

## **1. Introduction**

The main role of an accounting information system is to provide useful information that helps users make better decisions (Dewanti et al. 2019; Eliwa et al. 2019). Accordingly, high-quality information supports investors' and creditors' judgments and decisions (Ardiansyah and Siregar 2013; Dewanti et al. 2019). Additionally, companies can provide non-financial information through sustainability and corporate governance reports (García-Sánchez and Noguera-Gámez 2017). However, providing different types of information can make it difficult to analyze a large amount of data and make decisions about a company's position (García-Sánchez and Noguera-Gámez 2017).

Consequently, the International Integrated Reporting Council (IIRC) encourages companies to integrate their non-financial and financial information in a single report, which is called integrated reporting (Barth et al. 2017; Maama and Marimuthu 2021). This report provides information about the company's strategy, environment, social and governance issues, and value creation activities (Barth et al. 2017; Maama and Marimuthu 2021; Falatifah and Hermawan. 2021). Integrated reporting is an essential strategy to support stakeholders (Maama and Marimuthu 2021). Hence, integrated reporting improves transparency accountability, and the quality of information available to decision makers and increases the efficiency of capital allocation (Muttakin et al. 2020; Ahmed et al. 2021). Furthermore, the information contained in integrated reporting can affect investors' and creditors' expectations about a company's risks, actual position, future performance, and cost of capital (Ardiansyah and Siregar 2013; García-Sánchez and Noguera-Gámez 2017).

Additionally, earnings quality as an indicator of financial reporting quality, can affect investors' and creditors' decisions and their predictions about a company's future cash flows (Dewanti et al. 2019; Ezat 2019). Furthermore, it is the main

sign of a company's financial performance because it reduces information risk and the cost of capital (Ardiansyah and Siregar 2013; Dewanti et al. 2019; Ezat 2019). Concerning investment decisions, earnings are important for investors and creditors because they reflect asymmetric information, and the company's position (Ardiansyah and Siregar 2013).

Most previous studies have examined the relationship between earnings quality or integrated reporting and audit fees, voluntary disclosure, earnings management, or firm performance (e.g., Ardiansyah and Siregar 2013; Ezat 2019; Adegboyegun et al. 2020). On the other hand, few previous studies examine either the effect of earnings quality on the cost of capital (Persakis and Iatridis 2017; Lestari and Rahayu 2017; Ezat 2019) or the effect of integrated reporting on the cost of capital (Barth et al. 2017; Vena et al. 2020; Mohaisen et al. 2021), and their results are still inconsistent. Moreover, most of these studies were conducted in developed countries, which limits the universality of their results in developing countries. Therefore, this study attempts to fill the gap in the literature by providing empirical evidence for the relationship between earnings quality, integrated reporting, and the cost of capital in developing countries by depending on a sample of Egyptian companies listed on EGX 100. Furthermore, this study adds to the inconsistent debate of previous studies by showing investors' and creditors' inclusion of financial and non-financial information in decision making.

Accordingly, consistent with previous studies, the main goals of this study are as follows: first, examine the associations between earnings quality and the cost of capital. Second, examine the associations between integrated reporting and the cost of capital. Third, examine the joint effect of earnings quality and integrated reporting on the cost of capital. To assess this relationship, the study used a

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sample of 324 observations corresponding to 81 companies from 2016 through 2019.

The findings show a significant negative relationship between earnings quality and both the cost of debt, and the cost of capital, confirming that companies with higher earnings quality enjoy a lower cost of debt and cost of capital. Further, the cost of equity and the cost of capital are lower for companies with integrated reporting. On the other hand, research findings show an insignificant negative relationship between earnings quality and cost of equity. Companies with higher earnings quality do not have a lower cost of equity capital. The results also show an insignificant negative relationship between the integrated reporting and the cost of debt. This evidence suggests that Egyptian banks do not price the integrated reporting. Regarding the joint effect of earnings quality and integrated reporting on the cost of capital, the results are consistent with the seventh research hypothesis. Specifically, the cost of capital is lower for companies with integrated reporting and higher earnings quality.

This study contributes to the extant literature on the relationship between integrated reporting, earnings quality, and cost of capital in several ways. First, it extends the previous literature that investigated the relationship between earnings quality and cost of capital and the relationship between integrated reporting and cost of capital by examining the relationship between earnings quality, integrated reporting, and the cost of capital in the context of developing countries based on a sample of Egyptian companies listed on EGX 100. Second, it extends the previous literature that investigated the effect of earnings quality and integrated reporting on the cost of capital by examining the direct and joint effects of earnings quality and integrated reporting on the cost of capital. This represents an important contribution because the direct effect of earnings quality

or integrated reporting and the joint effect of both on the cost of capital differ in their impact on investors' and creditors' decisions.

Third, although previous research focuses on the relationship between voluntary disclosure and the cost of capital (Ardiansyah and Siregar 2013), this study focuses on integrated reporting, which contains financial and non-financial information, and examines its impact on the cost of capital. Fourth, according to the researcher's knowledge, this study examines the scarcely investigated association between earnings quality or integrated reporting and the cost of capital in emerging markets. Therefore, this study is the first to examine the direct and joint effects of earnings quality and integrated reporting on the cost of capital, which represents the main contribution to the extant literature.

The remainder of this paper is organized as follows. Section II reviews and analyzes previous studies and develops the research hypotheses. Section III presents the research methodology, which is composed of sample selection, variable definitions, and empirical models. Finally, section IV discusses the empirical results. Finally, Section V presents the conclusion, limitations, and areas for future research.

## **2. Literature Review and Hypotheses Development**

### **The relationship between earnings quality and cost of equity, cost of debt, and cost of capital.**

Earnings quality refers to the ability to realize the probability of expected future earnings based on reported earnings (Momenzadeh and Abbaszadeh 2013; Kamarudin and Ismail 2014). It is the main characteristic of financial reporting and a reflection of the company's performance (Ezat 2019). It is very important for a wide variety of users such as investors who use it as the main tool to determine and evaluate investment opportunities (An 2017). Moreover, it can

also be used for contracting purposes and for extracting valuable information from the earnings patterns (An 2017).

The quality of reported earnings depends on the degree to which they reflect the operational fundamentals and informativeness of companies' financial performance (Mohammady 2010; Kamarudin and Ismail 2014; Sousa and Galdi 2016). Consequently, it can be determined by the measurements of financial performance and its relevance for decision making (Sousa and Galdi 2016). Therefore, the higher quality of reported earnings numbers, the higher the information of the future company's value will be (Mohammady 2010).

Furthermore, earnings quality is an indicator of financial reporting quality, which helps users predict a company's future performance. It is very important for the capital and debt markets because it reduces the information asymmetry between uniformed users and management, improves transparency, and helps lenders and investors assess the company's future cash flow and its ability to survive in the long run (Ezat 2019).

The cost of capital can be defined as the cost charged by the company to creditors of debt, shareholders of preferred equity, and common equity in exchange for essential funds (Vélez-Pareja and Tham 2010; Persakis and Iatridis 2017; Ezat 2019). It consists of two components: cost of debt and cost of equity capital (Pratt 2003; Doval 2018). These two components represent a company's capital structure (Persakis and Iatridis 2017; Ezat 2019). The cost of equity is the returns, such as dividends that investors expect to get in exchange for their funding (Franceys et al. 2011; Ezat 2019). While the cost of debt is the source of funding provided by creditors or banks in exchange for interest (Ezat 2019). Therefore, companies can raise their capital through equity by issuing new common shares, preferred shares, or depending on their retained earnings (Doval 2018; Ezat 2019). They can also raise their capital through debt by borrowing

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money from banks, financial institutions, suppliers, or issuing bonds (Pratt 2003; Doval 2018).

Several studies have explained the relationship between earnings quality and cost of equity and have achieved mixed results. For example, Ardiansyah and Siregar (2013) investigated the relationship between earnings quality and the cost of equity capital for a sample of 75 manufacturing companies listed on the Indonesian Stock Exchange in 2008. The results illustrated that a higher earnings quality resulted in a lower cost of equity capital.

Similarly, a study on the London Stock Exchange by Eliwa et al. (2016) examined the association between earnings quality and the cost of equity capital for a sample of 4,214 observations during the period 2005–2011. They used four earnings quality proxies: accruals quality, earnings persistence, earnings predictability, and earnings smoothness. The results showed a significant negative association between all proxies for earnings quality and the cost of equity capital.

Similar evidence is provided by Dewanti et al. (2019), who explored the effect of disclosure and earnings quality on the cost of equity capital for a sample of 87 manufacturing companies listed on the Indonesia Stock Exchange during the period 2013–2017. The results pointed out that a high level of disclosed information and earnings quality reduced the cost of equity capital. Furthermore, information asymmetry and variation in information accuracy lead to an increase in information risk and the company's cost of capital. Therefore, some previous studies suggest that information risk and the cost of capital can be reduced by increasing earnings quality. In support, Ahmed et al. (2021) examined the moderating effect of institutional ownership and legal system origins on the relationship between earnings quality and the cost of equity capital. Based on a sample of 948 listed companies from the USA, the UK, and Germany during the

period 2005–2018, they found a significant negative association between accruals quality and the cost of equity capital.

However, other studies found no association between earnings quality and the cost of equity capital. For example, Indarti et al. (2019) investigated using 108 manufacturing companies listed on the Indonesia Stock Exchange during 2014–2016, the direct and indirect effect of earnings quality on the cost of equity capital. The results showed a significant positive effect of information asymmetry on the cost of equity capital. The results also revealed an insignificant relationship between earnings quality and the cost of equity capital. Similarly, a study by Melinda and Barokah (2019) found a positive association between earnings quality and the cost of equity capital. The authors pointed out that lower earnings quality is associated with higher information asymmetry and a lower cost of equity capital.

Furthermore, few studies have examined the association between earnings quality and the cost of debt. Carmo et al. (2016) examined the relationship between earnings quality and the cost of debt for Portuguese private companies. Using a sample of 10,283 observations during the period 2001–2007, they found a significant negative relationship between earnings quality and the cost of debt. The authors also found that the effect of earnings quality on the cost of debt was higher for companies that have audited their financial statements by big audit firms.

Additionally, earnings quality plays an important role in reducing adverse selection risk, and moral hazard problems. It is also essential for creditors to estimate future cash flows, default risk, and interest rate. On this basis, Beltrame et al. (2017) examined the role of earnings quality in reducing information asymmetry and the cost of debt for a sample of 6707 Italian non-financial medium-sized enterprises during 2004–2012. The results indicated a significant

negative association between earnings quality, information asymmetry, and cost of debt. Recently, for a sample of 6,821 German non-listed companies during the period 2013–2015, Ramerman (2019) investigated the relationship between earnings quality and the cost of debt. The results indicated that earnings quality helped creditors predict future cash flows, default risk, and a company's ability to pay its loans.

Using accruals quality as a proxy for earnings quality, Eliwa et al. (2019) examined the effect of accruals quality on the cost of debt. They used a sample of non-financial companies with 32,126 observations during the period 2005–2014, and the results showed that companies with good earnings quality had a lower cost of debt than the others. Focusing on the code-low country, a recent study by Houcine and Houcine (2020) examined for a sample of 220 French non-financial listed companies during the period 2005–2015, the effect of earnings quality on the cost of debt. The authors found a significant negative association between earnings quality and the company's interest cost. Further, the study pointed out that the accruals quality was found to have a greater effect on the cost of debt than the discretionary accruals.

Le et al. (2021) investigated the impact of accruals quality on the cost of debt and the difference in the impact of innate and discretionary accruals on the cost of debt. The authors demonstrated that companies with good accruals quality received a 1.35% lower cost of debt than companies with poor accruals quality. They also found a significant negative association between discretionary accruals and the cost of debt and an insignificant impact of innate accruals on the cost of debt.

Several studies demonstrated the impact of earnings quality on the cost of capital. For example, Gray et al. (2009) examined the effect of accruals quality on the cost of capital for a sample of 509 Australian companies during the period

1998–2006. The results indicate a significant negative association between innate accruals quality and the cost of capital, and no association between discretionary accruals and the cost of capital. Similarly, Demirkan et al. (2012) examined for a sample of 35,460 observations during the period 1984–2003, the effect of innate and discretionary accruals quality on the cost of capital. The innate accruals quality was found to have a negative impact on the cost of capital, while the discretionary accruals quality was found to have a positive impact on the cost of capital.

A study during the financial crisis by Persakis and Iatridis (2015) indicated a significant negative effect of earnings quality on the cost of equity capital in the pre-crisis period. Further, the study indicated a significant negative association between earnings quality and the cost of debt in pre and during crisis periods. Focusing On discretionary accruals as a proxy for earnings quality, Lestari and Rahayu (2017) investigate the relationship between earnings quality and the cost of capital for a sample of 290 manufacturing companies listed on the Indonesia Stock Exchange during the period 2010–2014. The results revealed a significant negative association between earnings quality and the cost of capital.

Persakis and Iatridis (2017) provided evidence of the relationship between earnings quality and cost of capital. Using a sample of 199,516 observations from 11 Eurozone and eight Asian countries over the period 2000–2014, the results revealed a significant negative association between earnings quality and the cost of equity capital in Eurozone and Asian countries. Regarding the joint effect of earnings quality, IFRS adoption, and investor protection on the cost of capital, the results indicated that the cost of capital was lower for companies with good earnings quality, investor protection, and after IFRS adoption. Further, Ezat (2019) found a significant negative effect of readability and earnings quality on the cost of capital.

Consequently, based on the analysis of previous studies, earnings quality improves transparency and reduces information asymmetry, information risk, and conflict between managers and shareholders. It also improves the users' ability to evaluate a company's current and future performance. In addition, the interest rate depends on the quality of earnings. Therefore, good earnings quality helps lenders predict the company's borrowing position and loan repaying capability. Consequently, the higher the earnings quality, the lower the information asymmetry between managers and lenders, and the lower the interest rate. Based on this evidence, the first three hypotheses can be derived as follows:

**H1: Earnings quality has a significant negative effect on the cost of equity capital.**

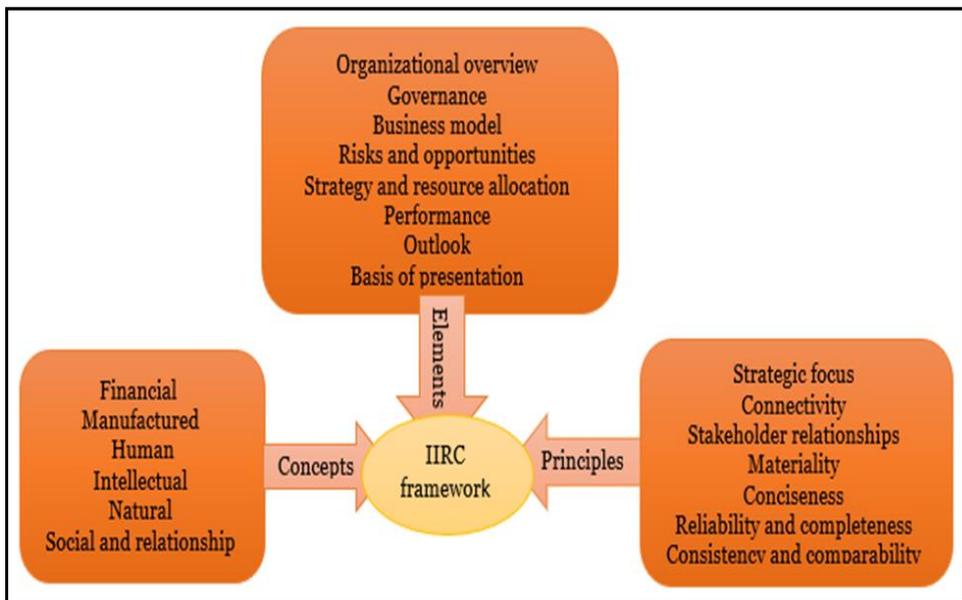
**H2: Earnings quality has a significant negative effect on the cost of debt.**

**H3: Earnings quality has a significant negative effect on the cost of capital.**

**The relationship between integrated reporting and the cost of equity, the cost of debt, and the cost of capital.**

Integrated reporting (IR) promotes a cohesive and organized approach to financial and non-financial reporting and communicates all material information that affects the company's future value to users (De Villiers et al. 2014). The International Integrated Reporting Council (IIRC) defines it as a communication tool of how the company's strategy, governance, performance, and prospects within its external environment can lead to value creation over time (Jhunjhunwala 2014; Cheng et al. 2014; Romolini et al. 2017; Adegboyegun et al. 2020; Iacuzzi et al. 2020).

The mission of the IIRC is to overcome the isolation of financial and non-financial information and provide integrated thinking of both financial and non-financial performance (De Villiers et al. 2014; Mishra et al. 2021). Therefore, integrated reporting helps stakeholders acquire material information regarding a company's performance, strategy, and governance in a comparable format (De Villiers et al. 2014). In December 2013, the IIRC published a framework for integrated reporting, as shown in figure 1, that helps companies create value in the long term by using their resources and relationships to interact with the external environment (Jhunjhunwala 2014; De Villiers et al. 2014). This framework focuses on the concepts, principles, and content elements of integrated reporting (El-Deeb 2019; Chanatup et al. 2020).



**Figure 1. IIRC framework**

(Source: The researcher)

Integrated reporting overcomes the limitations of traditional reporting by including financial and non-financial information, which improves information quality and meets the needs of various users. It also represents a company's value

creation and allows users to better evaluate the company's performance and allocation of scarce resources (El-Deeb 2019). Few studies have investigated the relationship between integrated reporting and cost of equity. For example, Zhou et al. (2017) investigated the impact of integrated reporting on the cost of equity capital for a sample of 443 observations of companies listed on the Johannesburg Stock Exchange (JSE) during the period 2009–2012. The results revealed a significant negative association between integrated reporting, analysts' forecast errors, and analysts' forecast dispersion. Further, the authors concluded that integrated reporting improved the analysts' ability to assess a company's future financial performance.

Additionally, for a sample of 116 international companies that adopted integrated reporting from five different countries through 2016, Vitolla et al. (2020) investigated the impact of integrated reporting quality on the cost of equity capital. The authors found that high-quality integrated reporting improved companies' transparency, reduced information asymmetry, allowed investors to make precise forecasts, and attracted new investors, which reduced the cost of equity capital.

Zaro et al. (2022) investigated the effect of voluntary IR disclosure on the cost of equity capital and the impact of the enforcement environment on this relationship. Using a global sample of 25,311 observations during the period 2010–2017. The authors found a significant negative relationship between the voluntary disclosure of integrated reporting and the cost of equity capital. The authors also showed that the negative association between voluntary disclosure of integrated reporting and the cost of equity capital is higher for companies that operate in high-level enforcement environments. Salvi et al. (2020) concluded that intellectual capital disclosure in integrated reporting reduced information

asymmetry and increased long-term investors' attention, which reduced companies' cost of equity capital.

The voluntary information contained in the integrated reporting increases investors' trust and reduces information asymmetry between management and external users, which reduces investors' supervision cost and cost of equity capital. Flatfish and Herma wan (2021) examined the effect of the disclosure level of integrated reporting on the cost of equity capital for a sample of 146 companies with 373 observations during the period 2015–2017. The results revealed a significant negative association between the disclosure level of integrated reporting and the cost of equity capital.

Integrated reporting improves the information environment, which enhances lenders' understanding of the company's financial position. Further, lenders have more incentives to obtain more information about borrowers than investors, who depend mainly on the information provided by market participants. Some studies have examined the relationship between integrated reporting and the cost of debt, and they obtained similar results. For example, Tang (2017) examined the relationship between integrated reporting and the cost of debt in public and private markets for a sample of 3,976 global companies with 39,629 observations during the period 2002–2015. The results demonstrated a significant negative relationship between integrated reporting and the cost of debt. Muttakin et al. (2020) examined the direct effect of integrated reporting on the cost of debt and the moderating effect of integrated reporting on the relationship between financial reporting quality and the cost of debt. They depended on 847 observations drawn from non-financial companies listed on the Johannesburg Stock Exchange during the period 2009–2015. The authors found that companies that provided integrated reporting incurred a lower cost of debt than companies that did not provide integrated reporting. They also found an inverse

association between financial reporting quality and the cost of debt, and this relationship was stronger for companies with integrated reporting than the others.

Furthermore, using a sample of 834 European listed companies during the period 2015–2017, Gerwanski (2020) examined the effect of voluntary preparation of integrated reporting on the cost of debt. The results revealed that integrated reporting provided more information than traditional reporting, which improved lenders' ability to assess investment risk and reduced the cost of debt. Raimo et al. (2021) found that high-quality integrated reporting improved transparency reduced information asymmetry and helped lenders assess the default risk of borrowing, which reduced the cost of debt.

Integrated reporting includes reporting of integrated risk management, which reduces credit risk and results in a lower cost of debt. A recent study by Panfilo et al. (2022) examined the relationship between the adoption of IR and the cost of debt for a sample of 92 South African companies listed on the Johannesburg Stock Exchange (JSE) with 644 company-year observations during the period 2008–2014. The authors concluded that the implementation of integrated reporting reduced the risk premium for credit risk, which was reflected in the reduction in the cost of debt.

Other studies have examined the association between integrated reporting and the cost of capital. García-Sánchez and Noguera-Gámez (2017) investigated the effect of integrated reporting on the cost of capital for a sample of 995 companies in 27 countries, with 3294 observations during the period 2009–2013. The results indicated that companies with higher information asymmetry, lower investors protection, and higher previous cost of capital prepared integrated reporting to reduce the current and future cost of capital. In contrast, for a sample of 292 observations for 79 companies listed on the Johannesburg

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Stock Exchange during the period 2011–2014, Barth et al. (2017) found no association between integrated reporting quality and the cost of capital.

Furthermore, Vena et al. (2020) found a negative relationship between integrated reporting and the cost of capital. Companies that adopted integrated reporting had a 1.4% decrease in the cost of capital. Mohaisen et al. (2021) examined the impact of integrated reporting disclosure on the cost of capital for a sample of 27 companies listed on the Iraq stock exchange during the period 2016–2019. The authors concluded that integrated reporting disclosure provided information about the company's strategy, and its ability to create value, which reduced the cost of capital.

Moreover, integrated reporting provides voluntary disclosures about the company's strategy, performance, and social and governance issues, which reduces the cost of capital. Maama and Marimuthu (2021) investigated for a sample of 147 companies listed in ten SSA countries, during the period 2009–2018, the impact of IR on the cost of capital. The results showed that integrated reporting has a significant negative relationship with the cost of capital. Therefore, the authors concluded that companies that sent positive signals to the market about their value creation and future performance had a lower cost of capital.

Accordingly, integrated reporting includes relevant information that helps users to assess and process a company's current and future performance. It also provides a comprehensive overview of a company's ability to create value in the short and long term. Moreover, it is important to provide good accountability and risk management, which improves a company's reputation and ability to obtain funds from creditors and investors. Further, the availability of financial and non-financial information in integrated reporting allows investors and creditors to better understand a company's performance and risk. Therefore,

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integrated reporting is expected to reduce information risk and risk premium, leading to a lower cost of capital. Based on this evidence, the other three hypotheses can be derived as follows:

**H4: Integrated reporting has a significant negative effect on the cost of equity capital.**

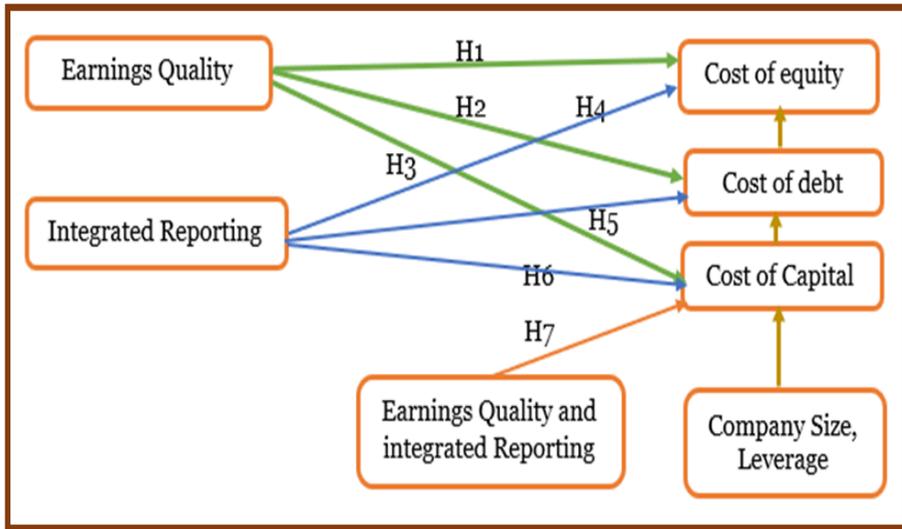
**H5: Integrated reporting has a significant negative effect on the cost of debt.**

**H6: Integrated reporting has a significant negative effect on the cost of capital.**

Furthermore, earnings quality and integrated reporting improve transparency and reduce information asymmetry and adverse selection risks. They also help investors and creditors in assessing a company's risks and opportunities, evaluating its current and future performance, and its ability to create value and cover its short and long-term debts, which reduces the cost of funds. Thus, this study examines the joint effect of earnings quality and integrated reporting on the cost of capital to show how both affect it. Thus, the seventh research hypothesis is as follows:

**H7: Earnings quality and integrated reporting have a significant negative joint effect on the cost of capital.**

Based on the previous discussion, the researcher derived the following model:



**Figure 2: Research model**

### 3. Research Methodology

#### *Sample*

This study examines and analyzes the direct and joint effects of earnings quality and integrated reporting on the cost of capital. Therefore, data on earnings quality and integrated reporting were collected from annual reports, board of director reports, and sustainability reports. In addition, the opening and closing prices of shares were collected from the market screener, mubasher information, investing, and WSJ markets websites. Hence, the initial sample consisted of 400 observations for Egyptian companies listed on EGX 100 during the period 2016–2019. Nineteen companies with 76 observations were excluded because of incomplete or missing data on companies' stock prices and integrated reporting elements. Therefore, the final sample comprises 81 companies with 324 observations, as detailed in Table 1. The content analysis of annual reports was used to construct the integrated reporting index by searching for integrated reporting elements, which are organizational overview, governance, business

model, risks and opportunities, strategy and resource allocation, performance, outlook, and basis of presentation.

**Table 1: Sample selection**

Descriptions	Number of observations
Total sample	400
Less: missing stock prices data	(54)
Less: missing integrated reporting elements data	(22)
<b>Final sample</b>	<b>324</b>

### ***Variables***

The dependent variable is the cost of capital (CoC) and it consists of the cost of debt and the cost of equity. The cost of debt is measured by the interest rate on the company's debt as follows (Doval 2018):

Cost of debt=interest/principles  $\times$  (1-tax rate).

The cost of equity capital is measured by the Capital asset pricing model (CAPM) as follows (Boyer et al. 2017):

$$\text{CoE} = R_f + \beta (R_m - R_f)$$

### **Whereas:**

CoE=Cost of equity

R<sub>f</sub>=Risk-free rate

R<sub>m</sub>=Market return rate

(R<sub>m</sub>-R<sub>f</sub>)=Equity market risk premium.

β=Beta, which measures the volatility or systematic risk.

The beta coefficient can be calculated using the following formula:

Beta coefficient ( $\beta$ )=Covariance ( $R_e$ ,  $R_m$ )/variance ( $R_m$ )

**whereas:**

$R_e$ =The return of the company's stock, and it can be calculated using the following formula:

$R_e$ =(Ending stock price–initial stock price)/initial stock price.

$R_m$ =The return of the market, and it can be calculated using the following formula:

$R_m$ =(Ending market price–initial market price)/ initial market price.

The cost of capital is measured by depending on the weighted average cost of capital (WACC) as follows (Rehman and Raoof 2010):

$$WACC=(R_e \times E/V) + (R_d \times D/V)$$

**Whereas:**

$R_e$ = Cost of equity.

$R_d$ =Cost of debt.

$E/V$ =Proportional weight of the cost of equity.

$D/V$ =Proportional weight of the cost of debt.

$E$ =Market value of the company's equity.

$D$ =Market value of the company's debt.

$V$ =Total capital (equity and debt).

The independent variables are earnings quality and integrated reporting. Consistent with the research of (Persakis and Iatridis 2017; Dewanti et al. 2019; Ezat 2019) earnings quality is measured by using the performance-adjusted modified Jones model by Kothari et al. (2005) as follows:

$$TACC_{i,t} = \beta_0 + \beta_1(1/Assets_{i,t-1}) + \beta_2(\Delta ARV_{i,t} - \Delta REC_{i,t}) / Assets_{i,t} + \beta_3(PPE / Assets_{i,t}) + \beta_4 ROA_{i,t} + \varepsilon_{i,t}$$

**whereas:**

$\beta_0$  is the intercept.

$TACC_{i,t}$ : Total accruals based on earnings before extraordinary items of a company I and year t minus operating cash flows (CFO) of a company I and at the end of year t divided by the average total assets of the company I and year t.

$ASSET_{i,t-1}$ : Average total assets of a company I at the end of the previous year t-1.

$\Delta ARV_{i,t}$ : Change in the net revenue of a company I at the end of year t divided by the average total assets.

$\Delta REC_{i,t}$ : the change in account receivables of a company I at the end of year t divided by the average total assets.

$PPE_{i,t}$ : Value of property, plant, and equipment of a company I at the end of year t divided by the average total assets.

$ROA_{i,t}$ : Return on assets of a company I at the end of year t.

$\varepsilon$ : Residual error of a company I at the end of year t.

Integrated reporting is measured by constructing an IR checklist based on the IR framework issued by the IIRC in 2013. The IR framework contains eight elements with twenty-one dimensions, which they are the company's ethics, culture, vision, mission, ownership structure, main activities, competitive advantages, supply chain relationship, legal, social, and environmental issues, governance structure, leadership structure, competence, skills and experience, risk management, monitoring tools, and the boards' strategic decisions, business model, main risks and opportunities, resources allocation, performance, and challenges. A value of one is given for each element disclosed by the company,

and zero in the opposite case. Subsequently, the IR total score for each company is calculated by dividing the total IR dimensions disclosed by the company by the total IR dimensions using the following formula.

$$\text{IR index} = \frac{\text{The total IR dimensions disclosed by the company}}{\text{The total dimensions of the IR framework}}$$

Following the research of (Aldamen and Duncan 2013; Carmo et al. 2016; Ahmed et al. 2021), the control variables that can affect the cost of capital are firm size, and leverage. The logarithm of total assets measures the firm size at the end of the year, and the total debt to total equity measures the leverage at the end of the year.

### ***Empirical models***

Multiple regression analysis was used to test and identify the relationship between earnings quality, integrated reporting, and the cost of capital with two control variables: firm size, and leverage. Therefore, the first three hypotheses examine the relationship between earnings quality, and each of cost of equity, cost of debt, and the cost of capital, so they were tested using Models 1, 2, and 3 as follows:

$$\text{CoE}_{(i,t)} = \beta_0 + \beta_1 \text{EQ}_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{LEV}_{i,t} + \varepsilon_{i,t} \quad \text{Model (1)}$$

$$\text{CoD}_{(i,t)} = \beta_0 + \beta_1 \text{EQ}_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{LEV}_{i,t} + \varepsilon_{i,t} \quad \text{Model (2)}$$

$$\text{CoC}_{(i,t)} = \beta_0 + \beta_1 \text{EQ}_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{LEV}_{i,t} + \varepsilon_{i,t} \quad \text{Model (3)}$$

The other three hypotheses, H<sub>4</sub>, H<sub>5</sub>, and H<sub>6</sub>, examine the relationship between integrated reporting, and each of cost of equity, cost of debt, and the cost of capital, so they were tested using Models 4, 5, and 6 as follows:

$$\text{CoE}_{(i,t)} = \beta_0 + \beta_1 \text{IR}_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{LEV}_{i,t} + \varepsilon_{i,t} \quad \text{Model (4)}$$

$$\text{CoD}_{(i,t)} = \beta_0 + \beta_1 \text{IR}_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{LEV}_{i,t} + \varepsilon_{i,t} \quad \text{Model (5)}$$

$$\text{CoC}_{(i,t)} = \beta_0 + \beta_1 \text{IR}_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{LEV}_{i,t} + \varepsilon_{i,t} \quad \text{Model (6)}$$

The last research hypothesis examines the joint effect of integrated reporting and earnings quality on the cost of capital, so it was tested using Model 7 as follows:

$$\text{CoC}_{(i,t)} = \beta_0 + \beta_1 \text{EQ}_{i,t} + \beta_2 \text{IR}_{i,t} + \beta_3 \text{EQ} * \text{IR}_{i,t} + \beta_4 \text{Size}_{i,t} + \beta_5 \text{LEV}_{i,t} + \varepsilon_{i,t} \quad \text{Model (7)}$$

**Where:**

The company I is in year t.

$\beta_0$  = Intercept of each regression model.

$\beta_1, \beta_2, \beta_3, \beta_4,$  and  $\beta_5$  = Regression coefficient of independent variables.

CoE = Cost of equity capital.

CoD = Cost of debt.

CoC = Cost of capital.

EQ = Earnings quality.

IR = Integrated reporting.

EQ\*IR = Joint effect of earnings quality and integrated reporting.

Size = Company size.

LEV = Company leverage.

$\varepsilon_{i,t}$  = Error coefficient.

## 4. Results and discussion

### *Descriptive and correlation analysis*

The Kolmogorov–Smirnov test was used to determine the sample distribution and appropriate statistical techniques. As shown in Table 2, the values are sampled from a population that follows a normal distribution whereas p-value is greater than 0.05.

**Table 2. Normality test**

	Kolmogorov–Smirnov <sup>a</sup>		
	Statistic	df	Sig.
Total	.032	324	.200*

a. Lilliefors Significance Correction

\*. This is a lower bound of the true significance.

Table 3 outlines the descriptive statistics for all the variables, including integrated reporting, earnings quality, cost of equity, cost of debt, cost of capital, and control variables. The independent variables used in this research are integrated reporting, which ranges from 10 to 21 with a mean value of 16 and consistent score of 3.74 (SD). Earnings quality runs from -98.48 to -.08 with a mean value of -8.21 and lower consistent score of 10.90 (SD). The dependent variables of this study are the cost of equity capital, ranging from 3% to 81% with a mean value of 42%; the cost of debt ranging from 0% to 24% with a mean value of 9%; and the cost of capital, ranging from 4% to 79% with a mean value of 17%. Table 3 also provides a descriptive analysis of the control variables, company size, and leverage, with mean values of 14,273,940, and .480021, respectively.

**Table 3. Descriptive analysis of variables**

Variables	Mean	Min	Max	SD
<b>Panel A:</b> Independent Variables				
IR	16	10	21	3.74
EQ	-8.21	-98.48	-.08	10.90
<b>Panel B:</b> Dependent variables				
CoE	.4219	.0297	.8083	.1922
CoD	.0949	0	.24	.0798
CoC	.17	.04	.7910	.14.84
<b>Panel C:</b> Control variables				
Size	14,273,940	10,343,500	19,651,700	2,118,927
Leverage	.480021	.30	.9897	.24635
Number of observations	324			

Table 4 shows the matrix of the Pearson coefficient correlations. The highest value of the correlation coefficient is between the cost of debt and the cost of capital, which is significantly equal 84%. The integrated reporting is significantly positively correlated with earnings quality, with a value of 26%. It correlates negatively and significantly with the cost of equity, cost of debt, and cost of capital, whereas the coefficient values are 26%, 13%, and 27%, respectively. Earnings quality is significantly negatively correlated with both the cost of debt and the cost of capital, with the coefficient values of 68% and 35%, respectively. However, it is insignificantly correlated with the cost of equity. The correlation matrix also indicates a significant positive relationship between the cost of capital, and both cost of equity and the cost of debt, whereas the coefficient values are 50% and 84%, respectively. Finally, Table 4 shows an insignificant relationship between the cost of equity and the cost of debt.

**Table 4. Pearson coefficient correlation matrix**

	IR	EQ	CoE	CoD	CoC	Size	Leverage
IR	1						
EQ	.256**	1					
CoE	-.256**	-.083	1				
CoD	-.128*	-.682**	.095	1			
CoC	-.271**	-.359**	.501**	.84**	1		
Size	.542**	.069	-.092	-.088	-.161**	1	
Leverage	.278**	.002	-.048	-.068	-.130*	.605**	1

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

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

### ***Regression results***

Table 5 displays the OLS regression of Models 1, 2, and 3. The three models examine the impact of earnings quality on the cost of equity, cost of debt, and the cost of capital respectively. The table contains the expected sign, coefficients, t-statistics (in parentheses), and level of significance (represented by asterisks) for each variable. In contrast to the expectation of the first hypothesis, the results of Model 1 indicate that earnings quality has an insignificant negative impact on the cost of equity; the coefficient is  $-.026$  with an insignificant t-value of  $-1.489$ . These findings do not support H1, which predicts that the cost of equity of Egyptian companies is negatively related to their earnings quality, regardless of the company's size and leverage. However, these results are similar to those of previous studies (Indarti et al. 2019; Melinda and Barokah 2019).

Model 2 examines the relationship between earnings quality and the cost of debt. The result corroborates the expectations of H2: earnings quality is negatively related to the cost of debt, and companies with higher earnings

quality have a lower cost of debt. The coefficient of the EQ variable is statistically significant with a t-value of  $-16.844$ , a P-value less than  $0.05$ , and the model adjusted  $R^2$  is  $47\%$ . These results support H2 and are similar to those reached by Carmo et al. (2016), Eliwa et al. (2019), and Houcine and Houcine (2020).

Regarding the third research hypothesis, Model 3 shows a significantly negative impact of earnings quality on the cost of capital. As expected, companies with higher earnings quality have lower cost of capital. The coefficient of the EQ variable is negative and statistically significant, with a p-value less than  $.05$  and the model adjusted  $R^2$  is  $37\%$ . These results confirm the findings of the work done by Francis et al. (2008), Gray et al. (2009) and Persakis and Iatridis (2015). Overall, the results of Model 3 support H3.

**Table 5. Regression results for testing H1, H2, and H3**

Independent variables	Expected sign	Model 1	Model 2	Model 3
Constant	?	7.693***(-7.40)	95.496(.696)	-33.106(-.219)
EQ	-	-.026(-1.489)	-.398**(-16.844)	-.119**(-6.730)
Leverage	+	-.032(-1.435)	-.020(-.390)	-.045(-.140)
Size	-	-4.746(-1.861)	2.587(-.504)	-2.995(-.676)
Adjusted $R^2$	?	.073	.473	.374
F-statistics	?	2.216	49.257***	10.74***
Number of observations		324	324	324

**Note:** \*\*\* and \*\* indicate statistical significance at 1% and 5% levels, respectively.

Table 6 presents the results for Models 4, 5, and 6. The three models examine the impact of integrated reporting on the cost of equity, the cost of debt, and the cost of capital respectively. Model 4 examines the relationship

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between integrated reporting and cost of equity. This predicts that the integrated reporting companies bear a lower cost of equity capital. Confirming the findings of previous studies, such as those of Zhou et al. (2017), Vitolla et al. (2020), Salvi et al. (2020), and Falatifah and Hermawan (2021), the results support H4 and show that the integrated reporting has a negatively statistically significant impact on the cost of equity capital, whereas the coefficient is  $-2.088$  with P-value less than  $.05$  and the model adjusted  $R^2$  is  $15\%$ . This finding suggests that companies with integrated reporting have a lower cost of equity capital.

Model 5 evaluates the impact of integrated reporting on the cost of debt. Given that, integrated reporting reduces the company's risks and uncertainty, the fifth research hypothesis assumes an inverse relationship between integrated reporting and cost of debt. Inconsistent with research expectations, the results show that integrated reporting has an insignificant negative impact on the cost of debt, whereas the coefficient is  $-.432$ , and the whole model is insignificant as shown by its F statistic. These results do not support H5, and differ from those observed by Tang (2017), Muttakin et al. (2020), Raimo et al. (2021), and Panfilo et al. (2022).

Consistent with García-Sánchez and Noguera-Gómez (2017), Mohaisen et al. (2021), and Maama and Marimuthu (2021), H6 investigates the impact of the integrated reporting on the cost of capital. It predicts that integrated reporting has a significantly negative impact on the cost of capital. The results of Model 6 reveal a statistically significant negative impact of integrated reporting on the cost of capital, with a coefficient of  $-1.125$ , a P-value of less than  $.05$ , and the model adjusted  $R^2$  is  $24\%$ . These results support H6 and suggest that companies that provide integrated reporting incur a lower cost of capital.

**Table 6: Regression results for testing H4, H5, and H6**

Independent variables	Expected sign	Model 4	Model 5	Model 6
Constant	?	-258.798(-1.411)	17.134*** (3.034)	-164.042(-1.519)
IR	-	-2.088** (-4.785)	-.432(-1.762)	-1.125**(-4.381)
Leverage	+	-.009(-.124)	-.019(-.390)	-.041(-1.015)
Size	-	-12.427(-1.591)	-.029(-.477)	-8.126(-1.768)
Adjusted R <sup>2</sup>	?	.15	.11	.24
F-statistics	?	6.706***	1.908	7.547***
Number of observations		324	324	324

**Note:** \*\*\* and \*\* indicate statistical significance at 1% and 5% levels, respectively.

Table 7 presents the results of Model 7, which examines the joint effect of integrated reporting and earnings quality on cost of capital. This model predicts that the integrated reporting and earnings quality reduce the cost of capital. Consistent with hypothesis 7, the results reveal a statistically significant negative impact of both the integrated reporting and the earnings quality on the cost of capital, with a coefficient of  $-0.012$ , a P-value less than  $.05$ , and the model adjusted R<sup>2</sup> is 32%. This finding suggests that companies with high earnings quality and provide integrated reporting bear a lower cost of capital.

**Table 7: Regression results for testing H7**

<b>Independent variables</b>	<b>Expected sign</b>	<b>Model 7</b>
Constant	?	22.728***(4.051)
IR	-	-1.047**(-4.382)
EQ	-	-.109**(-6.272)
IR*EQ	-	-.012**(-2.538)
Leverage	+	-.077**(-2.185)
Size	-	-3.761 (-.948)
Adjusted R <sup>2</sup>	?	31.8
F-statistics	?	16.787***
Number of observations		324

**Note:** \*\*\* and \*\* indicate statistical significance at 1% and 5% levels, respectively.

## 5. Conclusion

This study analyzed the relationship between earnings quality, integrated reporting, and the cost of capital for a sample of 81 companies listed on EGX during the period 2016–2019. Based on previous studies, this study derived seven hypotheses, the first three hypotheses investigated the relationship between earnings quality, cost of equity, cost of debt, and cost of capital. They expected that earnings quality reduces the cost of equity, cost of debt and the cost of capital. The results showed that the earnings quality has a negative effect on the cost of debt, and cost of capital. This evidence supports the second and third hypotheses: companies with higher earnings quality bear lower cost of debt and cost of capital. However, regarding the relationship between earnings quality and the cost of equity, the results indicated an insignificant negative effect of earnings quality on the cost of equity. This evidence differed from those of Eliwa et al. (2016), Dewanti et al. (2019), and Ahmed et al. (2021).

Furthermore, the study investigated the relationship between integrated reporting, cost of equity, cost of debt and cost of capital. It is expected that the integrated reporting reduces cost of equity, cost of debt, and cost of capital. The results revealed a significant negative association between integrated reporting and both the cost of equity and cost of capital. Companies that provide integrated reporting incur lower cost of equity and cost of capital. Concerning the association between integrated reporting and the cost of debt, the results differed from research expectations, as companies that provide integrated reporting do not bear a lower cost of debt. It does not, for that reason, corroborate the findings of Tang (2017), Gerwanski (2020), Muttakin et al. (2020), and Raimo et al. (2021). Eventually, the results demonstrate a significant negative effect of both earnings quality and integrated reporting on the cost of capital.

In the line of the above findings, this study has some limitations. **First**, the study was only conducted on Egyptian listed companies in EGX 100; therefore, the results of this study cannot be generalized to all Egyptian listed companies. Therefore, future research could extend the sample by examining this relationship for all listed Egyptian companies. **Second**, due to the COVID-19 pandemic for all financial markets worldwide, this study was conducted during the period of 2016–2019, so future research can investigate the impact of this pandemic on the relationship between earnings quality, integrated reporting, and the cost of capital. **Third**, this study was conducted only in Egypt, so it did not include a country analysis that allow the comparison among different countries. Consequently, future research can examine the impact of culture and investors behavior on the relationship between earnings quality, integrated reporting, and the cost of capital.

**Fourth**, this study depended on the company's annual reporting and content analysis methods to measure the IR; hence, the process of measuring IR may contain some personal judgments. For this reason, future research can depend on another IR index to compare the results of this study with those of the others. **Fifth**, this study depended on the performance-adjusted modified Jones model as a proxy for earnings quality since the literature does not state the best proxy for earnings quality. Nevertheless, future research should use a different proxy for earnings quality to ensure the robustness of the results. **Finally**, CAPM was used to measure the cost of equity because it is the most popular model. However, future research should use a different proxy to ensure the robustness of the results.

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