# THE EFFECT OF AUDIT QUALITY ON DEBT AND INTEREST COVERAGE RATIOS: THE MODERATING EFFECT OF THE COVID-19 PANDEMIC

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## Abstract

This paper investigates the impact of audit quality on the debt and interest coverage ratios of non-financial companies in Jordan, and the impact of the COVID-19 pandemic on this relationship. To achieve these objectives, a sample of 60 companies listed on the Amman Stock Exchange (ASE) during the years 2017–2021, was used. Descriptive statistics and multiple regression analysis were used to analyze the data and test the hypotheses. The findings of the study revealed that there is a significant negative effect of audit firm size on both the debt and interest coverage ratios, which is consistent with Mawutor et al. (2019). However, the effect of audit fees on both ratios is insignificant, which is consistent with Sayyar et al. (2015). Moreover, the impact of COVID-19 on the relationship between all variables is statistically insignificant, which contradicts the results of other studies (Kose et al., 2021). This means that the study provides additional and new evidence about the relationship between audit quality, debt ratio, and interest coverage ratio, within the context of the COVID-19 pandemic.

**Keywords:** COVID-19, Audit Quality, Debt Ratio, Interest Coverage Ratio, Growth Rate, Company Size

**Authors' individual contribution:** Conceptualization — E.N.S.A., A.A.-T.; Methodology — E.N.S.A., A.A.-T., O.M., and M.A.-H.; Validation — A.A.-T.; Formal Analysis — A.A.-T., O.M., and M.A.-H.; Investigation — A.A.-T., O.M., and M.A.-H.; Resources — A.A.-T., O.M, and M.A.-H.; Data Curation — A.A.-T.; Writing — Original Draft — E.N.S.A., A.A.-T. and O.M.; Writing — Review & Editing — A.A.-T., O.M., and M.A.-H.; Visualization — A.A.-T. and M.A.-H.; Supervision — E.N.S.A. and A.A.-T.; Project Administration — O.M. and M.A.-H.

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## 1. INTRODUCTION

Audit quality is a multifaceted concept (AL-Qatamin & Salleh, 2020; Ado et al., 2022) related to the overall effectiveness of an audit in providing reasonable assurance regarding the fairness of the financial statements (Ado et al., 2020, 2022). A high-quality audit provides confidence to users of the financial statements that they are free from material misstatements and reflect the economic substance of all events and transactions of an economic entity (Akrimi, 2021). This confidence

is expected to influence all types of users' decisions regarding the economic entity, including lending and borrowing decisions.

Audit quality is expected to influence the various financial metrics that help in assessing a company's ability to meet its obligations, including the debt and the interest coverage ratios. These ratios are both financial ratios that are commonly used to assess a company's financial health and risk level, as well as the company's ability to meet its debt and interest obligations (Ji, 2019). These ratios can be influenced by internal factors, external factors, and various market conditions. Moreover, global threats can affect such ratios in any given organization. A considerable example of these threats is the COVID-19 pandemic which threatened the world's health and human beings' well-being (Irwansyah et al., 2024; Alon et al., 2023). As the pandemic has caused widespread economic disruption, many businesses have faced challenges in maintaining their debt levels. Likewise, in some cases, high debt levels combined with a decline in interest coverage ratios can lead to bankruptcy (Famiglietti & Leibovici, 2020).

COVID-19 is an example that resulted in a big disturbance in business processes (Kahveci, 2023; Makni, 2023) that influenced businesses' performance and, therefore, their ability to get finances and cash (Almustafa et al., 2023; Diab et al., 2024). However, many studies reported the effect of COVID-19 on the financial outcomes of companies, and many other studies also reported the influence of audit quality on financial outcomes (Atayah et al., 2022). Furthermore, regulatory bodies such as the Financial Reporting Council (FRC, 2020) have issued guidance addressing the impact of the COVID-19 pandemic on audit quality, and its impact on business indebtedness. The council provided instructions on how to obtain sufficient, appropriate audit evidence so that the auditor could improve audit quality during the pandemic. Additionally, since the global outbreak of the COVID-19 pandemic had far-reaching implications across the world, Jordan was also not exempt from such implications. Therefore, this study will focus on examining the influence of the pandemic on the relationship between audit quality (audit firm size and audit fees), and the debt and interest coverage ratios of non-financial firms in Jordan.

This study is one of the very few studies that clarify the effect of audit quality on firm debt and the interest coverage ratios, and the influence of the COVID-19 pandemic on this relationship. Moreover, in Jordan, the effect of the COVID-19 pandemic on the relationship between audit quality and its components on debt and the interest coverage ratios of the non-financial firms has not been discussed. Therefore, this study will draw attention to the importance of getting high-quality audits and how they facilitate gaining investors' confidence amidst the COVID-19 pandemic. It is expected that the results of the study will help in directing the attention of the users of the financial statements, the professionals, and the regulators to the importance of audit quality. The anticipated outcomes of this study are expected to offer valuable insights that can benefit various stakeholders interested in the financial conditions of economic entities. By examining these factors, the study aims to contribute valuable insights into the dynamics between audit quality, debt, and interest coverage ratios, particularly within the context of the COVID-19 pandemic in Jordan.

The structure of this research paper consists of the following sections. Section 2 overviews the relevant literature, the relationship between the variables, and the development of hypotheses. Section 3 explains the research methodology including the study sample, data collection, and study model. Section 4 presents data analysis, hypothesis testing, and study results. Section 5 discusses the results of the study, and Section 6 concludes the research paper.

## 2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

### 2.1. Audit quality and debt ratio

Hayes (2024) defined the debt ratio as the proportion of a company's assets that are funded through borrowed money Additionally, DeAngelo (1981) described the quality of the audit as the technical abilities of the auditor (ability to spot major misstatements) and reporting of accounting misstatements (auditor independence). Audit quality has been the subject of a surge of research studies that used many proxies including audit firm size, industry specialization, audit fees, and auditor independence (Iliemena & Okolocha, 2019; Nana Yeboah et al., 2023). Researchers confirmed that audit quality may be quantified using a variety of additional parameters including audit firm rotation and audit fees (Iliemena & Okolocha, 2019). Importantly, many research studies supported considering both audit firm size and fees as proxies for audit quality (Ado et al., 2022; Iliemena & Okolocha, 2019; Cho et al., 2021; Huq et al., 2022).

A high-quality external audit is expected to provide better-quality accounting information (DeFond & Zhang, 2014) and is anticipated to enhance the firm's value and lower debt costs (Huq et al., 2022). Interestingly, researchers asserted that the audit firm size and audit fees have a significant influence on the debt ratio (Bacha, 2019; Iliemena & Okolocha, 2019; Mawutor et al., 2019). Therefore, this study will use these two variables as proxies for high-quality audits. Chang et al. (2009) documented that the debt ratio of companies decreases less in response to favorable market conditions when auditor quality is high, at least over the medium term. Therefore, this research proposes the following hypothesis:

*H1: There is a statistically significant impact of audit quality (firm size and audit fees) on the debt ratio of non-financial firms in Jordan.*

### 2.2. Audit quality and interest coverage ratio

Hayes (2024) defined the interest coverage ratio as the debt and profitability ratio and can be used to examine and give an opinion on the company's ability to meet the interest obligations on its existing loans, notes, and borrowings in general. Ji (2019) confirmed that the value of the accrual-based interest coverage ratio is a standard for avoiding bankrupt businesses. Since the interest coverage

ratio is used by previous studies as an indicator of financial stability, this study will examine how it will be affected by audit quality factors.

Higher audit quality may provide creditors and investors with a more accurate assessment of a company's financial health, thereby potentially bolstering their confidence in the company's capability to fulfill its debt obligations (Meryana & Setiany, 2021). Additionally, the high-quality audit improves corporate governance, which in turn expected to reduce the likelihood of financial irregularities or mismanagement increase the company's creditworthiness and lower its borrowing costs.

Minnis (2011) stated that audited firms have a significantly lower cost of debt and lenders place more weight on audited financial information in setting the interest rate. This can enhance the company's interest coverage ratio, which gauges the company's capacity to meet interest payments, making it easier for the company to fulfill its debt commitments and reduce its debt load (Chang et al., 2009). Moreover, improved audit quality is also expected to result in better risk management practices, which can reduce the risk of financial distress and default. This means that high audit quality is expected to influence lenders' decisions when setting interest rates. Therefore, based on the results of previous work related to the impact of audit quality on interest coverage ratio, this research proposes the following hypothesis:

*H2: There is a statistically significant impact for audit quality (firm size and audit fees) on the interest coverage ratio of non-financial firms in Jordan.*

### 2.3. The moderating effect of COVID-19 pandemic

The global COVID-19 pandemic has resulted in significant operational challenges to businesses and has brought increased business risks and uncertainties (Amrah & Hashim, 2020; Juwari, 2022, Almustafa et al., 2023; Nguyen Duc et al., 2024). Additionally, it has considerable effects on the field of external audit (Castka et al., 2020; Bedford et al., 2022; Feghali et al., 2022; Hazaea et al., 2022), necessitating auditors to confront various challenges and adapt their audit processes (Castka et al., 2020; Hazaea et al., 2022; Al-Ansi, 2022; Hegazy et al., 2022). Travel restrictions and lockdown measures have limited auditors' ability to conduct on-site visits and physical inspections of client operations (Serag & Daoud, 2021). These challenges to business and audit firms require conducting thorough audit assessments of various business issues including profitability, solvency, going concern, financial distress, financial statement disclosures, and management estimates and judgments. Researchers concluded that, on the one hand, the pandemic has many potential effects on various aspects of audit quality, including audit fees, assessments of going concern, human resources, operational procedures, staff remuneration, and overall effort (Albitar et al., 2020). On the other hand, researchers (Darabee, 2022; Gopalakrishnan et al., 2022; Gofran et al., 2023; Pemo et al., 2024) asserted the effects of the pandemic on many debt measures including debt financing, revealing the relationship between business vulnerability, lockdown measures, and borrowing patterns.

Notably, the COVID-19 pandemic has posed challenges, with increased interest rates elevating the cost of loan repayment for businesses (Kose et al., 2021). Consequently, this situation has the potential to lower a company's debt coverage ratio, which measures its ability to meet financial obligations. Likewise, in relation to audit quality Chang et al. (2009) observed that higher-quality auditing results in lower debt ratios in the medium run. Additionally, in relation to COVID-19 Akrimi (2021) concluded that the audit quality has been significantly affected by the coronavirus pandemic. Furthermore, Hazaea et al. (2022) concluded that COVID-19 has significantly impacted audit quality, particularly in terms of audit fees, audit procedures, and audit staff salaries. Therefore, this research proposes the following two hypotheses:

*H3: There is a statistically significant impact of the COVID-19 pandemic on the relationship between audit quality (firm size and audit fees) and the debt ratio of non-financial firms in Jordan.*

*H4: There is a statistically significant impact of the COVID-19 pandemic on the relationship between audit quality (firm size and audit fees) and interest coverage ratio of non-financial firms in Jordan.*

## 3. RESEARCH METHODOLOGY

### 3.1. Population, sample of the study and data collection

The study population encompasses all manufacturing and service Jordanian companies listed on the Amman Stock Exchange (ASE) during the years 2017–2021. The selected sample for this study included 60 companies that have their annual reports available for the years 2017–2021. The data required was collected from secondary sources including annual reports for manufacturing and service companies downloaded from the ASE website (https://www.ase.com.jo/en).

### 3.2. Regression model

The dependent variables will be measured using the debt ratio (*DR*) and the interest coverage ratio (*ICR*), while the independent variable, *audit quality*, will be measured using the audit firm size (*AFS*), and audit fees (*AF*). The moderating variable COVID-19 pandemic (*COVID19*) will be measured using a dummy variable for the years before the pandemic (2017–2019) and during the pandemic (2020–2021). The control variables include the company size (*CS*) and growth rate (*GR*). The following models will be used to test the study hypotheses:

*Model 1*

$$DR_{it} = \alpha + \beta_1 AF_{it} + \beta_2 AFS_{it} + \beta_3 CS_{it} + \beta_4 GR_{it} + \varepsilon_{it} \quad (1)$$

*Model 2*

$$DR_{it} = \alpha + \beta_1 AF_{it} + \beta_2 AFS_{it} + \beta_3 CS_{it} + \beta_4 GR_{it} + \beta_5 COVID19_{it} + \varepsilon_{it} \quad (2)$$

*Model 3*

$$ICR_{it} = \alpha + \beta_1 AF_{it} + \beta_2 AFS_{it} + \beta_3 CS_{it} + \beta_4 GR_{it} + \varepsilon_{it} \quad (3)$$

*Model 4*

$$ICR_{it} = \alpha + \beta_1 AF_{it} + \beta_2 AFS_{it} + \beta_3 CS_{it} + \beta_4 GR_{it} + \beta_5 COVID19_{it} + \varepsilon_{it} \quad (4)$$

where,

- $DR_{it}$ — debt ratio for firm ($i$) in a year ($t$), it equals total liabilities/total assets;
- $ICR_{it}$ — interest coverage ratio for firm ($i$) in year ($t$), it equals net income before interest and taxes/the total interest expenses;
- $AF_{it}$ — audit fees for a firm ($i$) in a year ($t$), it equals the natural log of audit fees;
- $AFS_{it}$ — audit firm size is a dummy variable coded "1" if the firm is audited by a Big 4 and "0" otherwise;
- $COVID19_{it}$ — COVID-19 pandemic dummy variable coded "1" for the years 2017–2019 before the COVID-19 pandemic, and "0" for the years 2020–2021 during the pandemic;
- $CS_{it}$ — company size, it equals the natural log of total assets;
- $GR_{it}$ — growth rate, it equals the net change in net sales divided by the prior year's net sales.

However, despite the relevance of the research methodology in achieving the study objectives, the study findings and limitations point to directions for future research to expand our understanding of audit quality and its impact on various financial decisions and the need to consider other measures of audit quality and other methodologies such as qualitative methodologies.

## 4. RESEARCH RESULTS

### 4.1. Descriptive statistics

As appears from Table 1, the data reveals that, during the period from 2017 to 2019, a percentage 62.2% of the companies were audited by non-Big 4 audit firms, while 37.8% of the companies were audited by Big 4 audit firms (KPMG, Ernst & Young — EY, PricewaterhouseCoopers — PwC, Deloitte). This indicates a higher prevalence of non-Big 4 audit firms during that period. However, during the pandemic (2020–2021), the distribution of audit firm choices experienced a slight shift. The frequencies demonstrate that 63.3% of the companies continued to select non-Big 4 firms for their auditing needs, while 36.7% of the companies opted for audits conducted by the Big 4 audit firms. These findings suggest a consistent preference for local audit firms as the majority choice for audits before and after the pandemic. However, it is important to note that the Big 4 audit firms still maintain a significant market presence and are chosen by a notable portion of the companies during both time periods.

**Table 1.** Descriptive statistics for audit firm size

| *Variable* | *Frequency* | *Percentage* |
|---|---|---|
| ***AFS 2017–2019*** | | |
| Non-Big 4 | 112 | 62.2 |
| Big 4 | 68 | 37.8 |
| ***AFS 2020–2021*** | | |
| Non-Big 4 | 76 | 63.3 |
| Big 4 | 44 | 36.7 |

**Table 2.** Descriptive statistics for audit fees

| *Min* | *Max* | *Mean* | *Std. dev.* |
|---|---|---|---|
| ***AF 2017–2019*** | | | |
| 580 JOD | 312,196 | 63,904 | 60,519 |
| ***AF 2020–2021*** | | | |
| 1,000 JOD | 471,309 | 58,019 | 65,264 |

*Note: JOD — Jordanian dinar.*

The second measure of *audit quality* is audit fees (*AF*). It appears from Table 2 that during the first period (2017–2019), the average audit fee was 63,904 JOD. It also appears that the lower value of audit fees reached 580 JOD and the maximum value was 312,196 JOD. Additionally, the standard deviation of 60,519 JOD highlights the dispersion of fee values around the average. This indicates a significant variability in fee amounts, suggesting a diverse fee structure within the Jordanian market. Transitioning to the second period (2020–2021), a few noteworthy changes can be observed in the audit fees. The minimum fee was increased to 1,000 JOD, indicating potential adjustments in pricing strategies or changes in the fee structures offered by auditing firms. It also appears that the maximum fee increased to 471,309 JOD, suggesting the possibility of premium services or higher fees for specialized or complex engagements. The average audit fee for this period decreased slightly to 58,019 JOD and the standard deviation of 65,264 JOD during this period indicates a relatively higher level of variability in the fee amounts. These results could reflect changes in the competitive landscape or adjustments in fee levels in response to market conditions, potentially influenced by market uncertainties, shifts in client demand, or changes in the competitive dynamics among auditing firms.

With respect to the dependent variables (*DR* and *ICR*), Table 3 presents descriptive statistics for the debt ratio. During the first period (2017–2019), the analysis reveals that the companies had a range of debt ratios spanning from 0.01 to 0.96, with an average of 0.29, suggesting a moderate overall level of indebtedness. There was also some variation in debt ratios among the companies, as indicated by a standard deviation of 0.20.

**Table 3.** The descriptive statistics for the debt and coverage ratios

| *Variable* | *Min* | *Max* | *Mean* | *Std. dev.* |
|---|---|---|---|---|
| ***DR*** | | | | |
| 2017–2019 | 0.01 | 0.96 | 0.29 | 0.20 |
| 2020–2021 | 0.02 | 1.00 | 0.33 | 0.23 |
| ***ICR*** | | | | |
| 2017–2019 | -8 | 120 | 11.86 | 24.67 |
| 2020–2021 | -11 | 125 | 9.34 | 24.76 |

For the pandemic period (2020–2021), there was a slight shift in debt ratios. The minimum debt ratio increased to 0.02, suggesting a slight upward trend in indebtedness compared to the previous period. The maximum debt ratio also slightly increased to 1.00. The average debt ratio for the companies in this period increased to 0.33. Additionally, the standard deviation also increased to 0.23, indicating a wider range of debt ratios and greater variability in the leverage levels among the companies.

These results showed a moderate level of indebtedness during the period preceding the pandemic, while the pandemic period showed a potential increase in leverage, with some companies experiencing higher levels of debt. The higher standard deviation in the second period suggests greater variation in the debt ratios, indicating varying degrees of financial risk and leverage management among the companies.

The results also showed that the interest coverage ratio started at a lower value of -8 to reach a maximum limit of 120. The average interest coverage ratio was 11.86, indicating a relatively healthy ability to cover interest expenses. However, it's important to note that the standard deviation of 24.67 suggests some variation in the interest coverage ratio among the companies, with different levels of ability to cover interest costs. Additionally, during the pandemic period, the results display some changes. The average interest coverage ratio decreased to 9.34 and the minimum interest coverage ratio decreased further to -11, indicating a potential strain on companies' ability to cover interest expenses. However, the maximum ratio remained relatively high at 125, suggesting that certain companies were still able to maintain a strong capacity to meet their interest obligations. Additionally, the standard deviation of 24.76 indicates a similar level of variation in the interest coverage ratio as observed in the first period. Potentially reflecting the overall impact of the pandemic on business operations (Rekha & Hossain, 2022).

## 4.2. Hypotheses testing

This section discusses the results of hypothesis testing including the impact of *audit quality* on *DR* and *ICR* and the impact of the pandemic on these relationships.

### *4.2.1. The effect of audit quality on the debt ratio*

It appears from Table 4 that the variance inflation factor (VIF) values are less than 10 which implies that multicollinearity is not a concern (Miles, 2014; Senaviratna & Cooray, 2019). The table shows that the $R^2$ value of 0.117 suggests that approximately 11.7% of the variability in the debt ratio can be explained by these variables altogether. The standard error of the estimate at 16.309% indicates the average distance between predicted and actual debt ratio values.

Additionally, the table shows the analysis of variance (ANOVA) results. It appears that there is a highly significant statistical relationship between the independent variables and the *DR*, as evidenced by the impressively low p-value of 0.000. Moreover, the F-ratio reveals an efficient model with a value of 6.455. This value suggests that incorporating *AFS, AF,* and the controlling variables contributes to a better prediction of the debt ratio. Thus, the chosen model effectively captures the intricate interplay between *AFS*, *AF*, *GR*, *CS*, and *DR* for non-financial Jordanian companies.

**Table 4**. Model summary and ANOVA for the effect of audit quality on the debt ratio

| ***Panel A: Model summary*** | | | | | |
|---|---|---|---|---|---|
| ***Model*** | ***R*** | ***R²*** | ***Adjusted R²*** | ***Std. error*** | ***R² change*** |
| Constant | 0.287 | 0.082 | 0.073 | 16.542% | 0.082 |
| 1 | 0.342 | 0.117 | 0.099 | 16.309% | 0.035 |
| ***Panel B: ANOVA results*** | | | | | |
| ***Model*** | ***Sum of squares*** | | ***Mean square*** | ***F-ratio*** | ***Sig.*** |
| Constant | 4832.608 | | 2416.304 | 8.831 | 0.000 |
| 1 | 6868.161 | | 1717.040 | 6.455 | 0.000 |

As appears from Table 5, there is a significant negative effect of *AFS* on the *DR* (beta = -0.194, t = -2.764, p-value = 0.01, VIF = 1.083). This suggests that larger audit firms are associated with lower *DR*. These findings may be attributed to the high reputation of big audit firms and their credibility in the market. Their size and resources enable them to attract better clients and maintain a robust client base. As a result, companies audited by larger audit firms may have better access to equity capital which represents the core funding of a business.

**Table 5.** Regression coefficients of the effect of audit quality on the debt ratio

| ***Variable*** | ***Beta*** | ***t*** | ***Sig. p-value*** | ***Tolerance*** | ***VIF*** |
|---|---|---|---|---|---|
| Constant | | -3.391 | 0.001 | | |
| *AFS* | -0.194 | -2.764 | 0.006 | 0.924 | 1.083 |
| *AF* | 0.022 | 0.300 | 0.765 | 0.814 | 1.228 |
| *GR* | 0.074 | 1.102 | 0.272 | 0.995 | 1.005 |
| *CS* | 0.312 | 4.172 | 0.000 | 0.811 | 1.233 |

In contrast, the coefficient for *AF* (beta = 0.022, t = 0.300, p-value = 0.765, VIF = 1.228) is insignificant, suggesting that there is an insignificant impact for *AF* on the *DR*. This result may be attributed to the fact that the companies often negotiate fees with audit firms, which could lead to a disconnect between the fees paid and the perceived quality of the audit. Therefore, despite the expectation that higher fees would correspond to better financial performance and lower debt ratios, this study does not find supporting evidence for such a relationship. Additionally, turning to the control variables, the *GR* (beta = 0.074, t = 1.102, p-value = 0.272, VIF = 1.005) does not show a significant effect on the *DR*. It is possible that companies with higher growth rates have access to alternative sources of financing, such as equity or venture capital, which reduces their reliance on debt financing. However, in contrast, *CS* (beta = 0.312, t = 4.172, p-value = 0.000, VIF = 1.233) exerts a substantial and statistically significant influence on the *DR* and may exhibit higher levels of *DR*. Larger companies may have more bargaining power and better access to debt markets, facilitating their access to capital by means of debt issuance.

### *4.2.2. The effect of audit quality on interest coverage ratio*

As appears from Table 6 the VIF values are less than 10 which implies that multicollinearity is not a concern. The $R^2$ value of 0.032 suggests that only approximately 3.2% of the variability in the interest coverage ratio can be explained by the variables (*AFS*, *AF*, *CS*, and *GR*). The standard error of the estimate at 26.710% reflects the average deviation between predicted and actual *ICR* values, indicating a moderate level of variability. Therefore, including the *audit quality* proxies in the model does not significantly enhance the prediction of the *ICR* compared to a model without these variables.

**Table 6**. Model summary and ANOVA for the effect of audit quality on the interest coverage ratio

| ***Panel A: Model summary*** | | | | | |
|---|---|---|---|---|---|
| ***Model*** | ***R*** | ***R²*** | ***Adjusted R²*** | ***Std. error*** | ***R² change*** |
| Constant | 0.063 | 0.004 | -0.007 | 26.944% | 0.004 |
| 1 | 0.179 | 0.032 | 0.010 | 26.710% | 0.028 |
| ***Panel B: ANOVA results*** | | | | | |
| ***Model*** | ***Sum of squares*** | | ***Mean square*** | ***F-ratio*** | ***Sig.*** |
| Constant | 519.147 | | 259.574 | 0.358 | 0.700 |
| 1 | 4222.173 | | 1055.543 | 1.480 | 0.210 |

Additionally, the table shows that the sum of squares illustrates the extent of variability in the *ICR* that can be attributed to *audit quality* proxies, which is 4222.173. This suggests that some variability in the ratio can be attributed to changes in *audit quality*. The mean square, 1055.543, represents the average variability in the ratio accounted for by *audit quality*. A higher mean square indicates a greater proportion of explained variability. The F-ratio of 1.480 tests the overall significance of the relationship. However, the relatively low F-ratio suggests that the observed relationship is insignificant.

Table 7 shows, when considering *AFS* as a proxy for *audit quality*, a significant negative effect of *AFS* on the *ICR* (beta = -0.176, t = -2.261, p-value = 0.025). However, when considering *AF* as a proxy for *audit quality*, the results reveal that there is an insignificant impact on *audit quality* on the *ICR* (beta = 0.011, t = 0.130, p-value = 0.897). The reason for this result may be attributed to the heterogeneity of audit engagements. Various factors, including company size, complexity, and risk profile, can significantly influence the audit fees charged by auditing firms. The diverse nature of audit engagements across different companies and industries makes it difficult to establish a reliable and substantial relationship between audit fees and the interest coverage ratio. Moreover, it is possible that companies with higher interest coverage ratios are perceived as less risky by audit firms, leading to lower audit fees.

**Table 7**. Regression coefficients for the effect of audit quality on the interest coverage ratio

| ***Variable*** | ***Beta*** | ***t*** | ***Sig. p-value*** | ***Tolerance*** | ***VIF*** |
|---|---|---|---|---|---|
| Constant | | 0.192 | 0.848 | | |
| *AFS* | -0.176 | -2.261 | 0.025 | 0.888 | 1.126 |
| *AF* | 0.011 | 0.130 | 0.897 | 0.807 | 1.238 |
| *GR* | 0.036 | 0.487 | 0.627 | 0.991 | 1.009 |
| *CS* | 0.005 | 0.066 | 0.947 | 0.802 | 1.247 |

### *4.2.3. The moderating effect of COVID-19 on the relationship between the audit quality and debt ratio*

As appears from Table 8 all VIF values are less than 10 which implies that multicollinearity is not a concern. The results show that, after adding the COVID-19 pandemic (*COVID19*) variable as a moderating variable, the coefficient of determination ($R^2$) increased slightly from 0.117 to 0.122. However, the adjusted $R^2$ remained at 0.099, suggesting that the overall improvement in model fit due to *COVID19* was not that important. Interestingly, the standard error of the estimate remained relatively consistent at around 16.305% after adding *COVID19* as a moderating variable, demonstrating that the accuracy of the model's predictions was insignificantly affected. Additionally, the ANOVA results before and after adding the moderating factor of *COVID19* revealed some differences in the sum of squares and mean squares. The sum of squares increased from 6868.161 to 7160.178, indicating a slight increase in the amount of the explained variation in the dependent variable when considering the moderating effect of *COVID19*. Additionally, the mean square decreased from 1717.040 to 1432.036, indicating a reduction in the average explained variation. However, the F-ratio after considering the effect of the moderating variable appears to be slightly less than its amount before adding the moderating variable, suggesting a slight change in the relationship between the variables after the inclusion of the moderating variable.

**Table 8**. Model summary and ANOVA for the moderating effect of COVID-19 on the relationship between audit quality and debt ratio

| ***Panel A: Model summary*** | | | | | |
|---|---|---|---|---|---|
| ***Model*** | ***R*** | ***R²*** | ***Adjusted R²*** | ***Std. error*** | ***R² change*** |
| Constant | 0.287 | 0.082 | 0.073 | 16.542% | 0.287 |
| 1 | 0.349 | 0.122 | 0.099 | 16.305% | 0.349 |
| ***Panel B: ANOVA results*** | | | | | |
| ***Model*** | ***Sum of squares*** | | ***Mean square*** | ***F-ratio*** | ***Sig.*** |
| Constant | 4832.608 | | 2416.304 | 8.831 | 0.000 |
| 1 | 7160.178 | | 1432.036 | 5.386 | 0.000 |

Looking at the regression coefficients after adding *COVID19* as a moderating variable, it appears from Table 9 that the coefficient for *AFS* (beta = -0.145) showed a slight decrease compared to its value before (beta = -0.194). However, both coefficients were negative and statistically significant, indicating a negative impact for *AFS* on the *DR* regardless of the impact of the pandemic.

**Table 9**. Regression coefficients of the moderating effect of COVID-19 on the relationship between the audit quality and debt ratio

| ***Variable*** | ***Beta*** | ***t*** | ***Sig. p-value*** | ***Tolerance*** | ***VIF*** |
|---|---|---|---|---|---|
| Constant | | 17.179 | 0.000 | | |
| *AFS* | -0.145 | -2.149 | 0.033 | 0.901 | 1.110 |
| *AF* | 0.132 | 1.770 | 0.078 | 0.735 | 1.361 |
| *COVID19* | -0.068 | -1.016 | 0.311 | 0.923 | 1.083 |
| *GR* | 0.023 | 0.350 | 0.727 | 0.918 | 1.089 |
| *CS* | 0.274 | 3.833 | 0.000 | 0.801 | 1.249 |

In terms of *AF*, the coefficient exhibited a relatively slight increase after adding *COVID19* as a moderating variable (beta = 0.132 vs beta = 0.022). This means that the inclusion of the *COVID19* as a moderating variable did not significantly alter this relationship. In other words, it appears that *COVID19* did not have a statistically significant moderating effect on the relationship between *audit quality* measured by *AF* and the *DR*. Consequently, based on the results obtained from these regression analyses, it can be concluded that *COVID19* does not have a significant impact on the relationship between *audit quality* (measured by both *AFS* and *AF*) and *DR*.

### *4.2.4. The moderating effect of COVID-19 on the relationship between audit quality and interest coverage ratio*

As appears from Table 10, all VIF values are less than 10 which implies that multicollinearity is not a concern. As the table shows, after incorporating *COVID19* as a moderating variable, the $R^2$ increased slightly from 0.032 to 0.037. However, the adjusted $R^2$ shows minimal improvement, increasing from 0.010 to 0.004. This suggests that the overall improvement in model fit due to *COVID19* as a moderating variable was so limited. The standard error of the estimate remained relatively consistent at around before and after adding the moderating variable. This indicates that the accuracy of the model's predictions was insignificantly affected by the inclusion of *COVID19* as a moderating variable.

**Table 10**. Model summary and ANOVA for the moderating effect of COVID-19 on the relationship between audit quality and interest coverage ratio

| ***Panel A: Model summary*** | | | | |
|---|---|---|---|---|
| ***Model*** | ***R*** | ***R²*** | ***Adjusted R²*** | ***Std. error*** |
| Constant | 0.063 | 0.004 | -0.007 | 26.944% |
| 1 | 0.192 | 0.037 | 0.004 | 26.791% |
| ***Panel B: ANOVA results*** | | | | |
| ***Model*** | ***Sum of squares*** | ***Mean square*** | ***F-ratio*** | ***Sig.*** |
| Constant | 519.147 | 259.574 | 0.358 | 0.700 |
| 1 | 4886.074 | 814.346 | 1.135 | 0.344 |

The results of the ANOVA show that after adding *COVID19* as a moderating variable, the sum of squares increased from 4222.173 to 4886.074, indicating a slight increase in the variability explained by the model. However, the corresponding mean square decreased from 1055.543 to 814.346, suggesting a reduction in the average variation accounted for by the model. This was reflected in the F-ratio, which decreased from 1.480 to 1.135.

Additionally, Table 11 shows that, after the inclusion of *COVID19*, the alterations detected in the regression coefficients were insignificant. The results show that the *AFS*, as an independent variable, displayed a slight increase in the negative effect of the *AFS* on the *ICR*, with the coefficient changing from -0.176 to -0.190. Similarly, the coefficient for *AF* remained largely unchanged, shifting minimally from 0.011 to -0.012. This suggests that *COVID19* does not have a significant impact on the relationship between *AF* and the *ICR*.

**Table 11**. Regression coefficients of the moderating effect of COVID-19 on the relationship between the audit quality and interest coverage ratio

| ***Variable*** | ***Beta*** | ***t*** | ***Sig. p-value*** | ***Tolerance*** | ***VIF*** |
|---|---|---|---|---|---|
| Constant | | 2.226 | 0.027 | | |
| *AFS* | -0.190 | -2.389 | 0.018 | 0.861 | 1.162 |
| *AF* | -0.012 | -0.134 | 0.893 | 0.728 | 1.374 |
| *COVID19* | 0.036 | 0.464 | 0.643 | 0.917 | 1.091 |
| *GR* | 0.048 | 0.623 | 0.534 | 0.922 | 1.084 |
| *CS* | 0.015 | 0.177 | 0.860 | 0.791 | 1.264 |

In conclusion, based on these findings, the results suggest that there is an insignificant impact of *COVID19* on the relationship between *AFS* and the *ICR* of non-financial firms in Jordan. Similarly, the results do not support the hypothesis that there is a statistically significant impact of *COVID19* on the relationship between *AF* and the *ICR* of non-financial firms in Jordan.

## 5. DISCUSSION OF THE RESULTS

The results of the study revealed that when considering audit firm size as a proxy for audit quality, there is a statistically significant negative impact for audit firm size on the debt ratio which may highlight the important role of larger audit firms in reducing debt levels. Although this result is inconsistent with some previous studies (Iliemena & Okolocha, 2019), it is consistent with other previous studies on the relationship between these variables (Chang et al., 2009; Bacha, 2019; Mawutor et al., 2019). Mawutor et al. (2019) concluded that companies that are audited by Big 4 audit firms have on average leverage ratios less than those of the companies that are audited by the non-Big 4 audit firms. This result may be attributed to the high reputation and credibility of big audit firms, which prefer to attract high-quality clients and, therefore, provide their clients with better access to equity capital. Larger audit firms also possess greater expertise and resources, enabling them to conduct more thorough audits and identify potential risks that could impact a company's debt obligations. Additionally, the provision of valuable non-audit services by larger firms can enhance financial management practices and reduce the need for excessive borrowing, promoting a more conservative financial approach and lower debt reliance. Furthermore, Chang et al. (2009) stated that companies audited by Big 6 audit firms are more likely to issue equity as opposed to debt than those audited by non-Big 6 firms.

However, when considering audit fees as a proxy for audit quality, the results revealed that the impact of audit fees on the debt ratio was insignificant. Although this finding contrasts the results of other studies (Mawutor et al., 2019), which found that audit fees significantly influenced the debt ratio of companies in Ghana, it is consistent with other studies (Sayyar et al., 2015) that provided evidence that audit fees may not exert a substantial influence on the debt ratio of a company. Management's negotiations with audit firms regarding audit fees may consider various factors such as the size and complexity of the engagement, client-specific circumstances, and competitive market forces.

The results also showed that there is a statistically significant negative impact of audit firm size on the interest coverage ratio. This suggests that big audit firms are significantly correlated with lower interest coverage ratios in Jordan. Additionally, the impact of audit fees on the interest coverage ratio was found to be statistically insignificant.

Furthermore, when considering the moderating effect of COVID-19 on the relationship between audit quality and debt ratio, the results revealed that there is a negative impact for audit firm size on the debt ratio regardless of the pandemic conditions. In other words, it appears that the COVID-19 moderating role on the relationship between audit firm size and debt ratio is insignificant.

In other words, the results may be influenced by the degree of the government restrictions and lockdowns and at the same time by the government responses for mitigating the impacts of these restrictions. Gopalakrishnan et al. (2022) stated that firms with higher pandemic exposure and those located in countries with stringent lockdowns have a higher propensity to raise debt.

Similarly, the investigation of the influence of the COVID-19 pandemic, as a moderating variable, on the relationship between audit quality (audit firm size and audit fees) and the interest coverage ratio yielded insignificant results. The results suggest that there is an insignificant impact of the COVID-19 pandemic on the relationship between audit firm size and the interest coverage ratio of non-financial firms in Jordan. Similarly, the results do not support the hypothesis that there is a statistically significant impact of the COVID-19 pandemic on the relationship between audit fees and the interest coverage ratio of non-financial firms in Jordan. This result is consistent with Haque and Varghese (2021) who concluded that companies affected by social distancing maintained their leverage ratios. Looking back at the results mentioned in the descriptive statistics section, we notice that the changes observed during the pandemic period suggest potential challenges faced by companies during the pandemic, reflected in the decreased average interest coverage ratio and lower minimum value. Additionally, the relatively high standard deviation in both periods indicates varying levels of interest coverage ratio among the companies regardless of the size of the audit firm or audit fees.

The pandemic may have forced some companies to delay or cancel planned capital expenditure. This delay, on the one hand, may result in reducing levels of debt financing, however, on the other hand, the pandemic conditions may lead companies to delay debt settlement. The delay in debt settlement is expected to result in an increase in interest rates and, therefore, a decrease in the interest coverage ratio. In other words, the COVID-19 pandemic has posed challenges, with increased interest rates elevating the cost of loan repayment for businesses (Kose et al., 2021; Joo & Mir, 2024). Consequently, this situation has the potential to lower a company's interest coverage ratio.

## 6. CONCLUSION

The conclusions of the study suggest that larger audit firms are associated with lower debt ratios, which may be attributed to the high reputation of big audit firms and their credibility in the market. The study also concludes that there is an insignificant impact of audit fees on the debt ratio. As explained in the previous section, this result may be attributed to the fact that the companies often negotiate fees with audit firms, which could lead to a disconnect between the fees paid and the perceived quality of the audit. Therefore, despite the expectation that higher fees would correspond to better financial performance and lower debt ratios, this study does not find supporting evidence for such a relationship.

Additionally, regarding the interest coverage ratio, the results showed that there is a statistically significant negative impact of audit firm size on the interest coverage ratio and that the impact of audit fees on this ratio was statistically insignificant.

Furthermore, the inclusion of COVID-19 as a moderating variable did not significantly alter the relationship between audit quality measured by audit firm size and audit fees and debt and interest coverage ratios. In other words, it appears that the COVID-19 pandemic did not have a statistically significant moderating effect on the relationship between audit quality measured by either audit firm size or audit fees and both the debt and interest coverage ratios.

Based on the conclusions of the study, the researchers would recommend that companies in Jordan consider engaging larger audit firms to lower their debt levels. The reputation, credibility, and resources of larger audit firms can contribute to a more thorough audit process, identification of potential risks, and enhanced financial management practices. By selecting a reputable audit firm, companies may benefit from better access to capital and reduced reliance on debt. Additionally, audit fees should be carefully negotiated and aligned with the quality of the audit engagements. Companies in Jordan should prioritize the selection of audit firms based on their expertise and reputation rather than focusing on minimizing audit fees.

Without diminishing the importance of the conclusions and recommendations of the study, it should be noted that the study is restricted to Jordanian non-financial listed companies, the findings may not be applicable to other countries or industries. Financial reporting and audit practices, as well as economic and legal systems, may differ across countries, influencing the relationship between the quality of the audit and the debt and interest coverage ratio. Therefore, additional research may be required to test the findings' validity in different contexts.

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