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Credit Confidence: The Impact of Disclosure Quality and Audit Quality on Bank Ratings in Emerging Economies

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Abstract

Purpose - This study aims to examine how Banks' credit ratings can be driven by the quality of the disclosed financial and non-financial information in emerging economies.

Design/methodology/approach - Using a sample of 1590 bank-year observations of 29 Islamic and 77 conventional banks across 17 MENA countries from 2006 to 2020, we conducted a random-effects regression model that is supported by various methods, including 2SLS and GMM models, to overcome the potential incidence of endogeneity concerns.

Findings - We found that the quality of voluntary disclosure positively influences the credit rating of Islamic and conventional banks. Although the spread and usefulness of disclosed information are positively associated with banks' ratings, the quantity dimension is not. Audit quality also significantly influences Islamic banks' credit ratings compared to their traditional counterparts.

Originality/value - Our paper contributes to the existing literature by investigating the effect of the quality of voluntary disclosures on credit ratings along three dimensions: quantity, spread, and usefulness of the information. Further, our research contributes to the international accounting literature by investigating the effect of audit quality on the credit ratings of both conventional and Islamic banks in a cross-country setting.

Practical implications - Our evidence offers practical implications for regulators and standards setters in emerging economies to develop more effective disclosure regimes to enhance the impact of the quality of banks' voluntary disclosures on their credit ratings.

Keywords: Quality of voluntary disclosure, Audit quality, Credit rating, Islamic and conventional banks.

1. Introduction

The significance of firms' credit ratings stems from their influence on the valuations of stocks, bonds and the contractual and regulatory costs linked to variations in credit ratings (Akorsu, 2023; Attig et al., 2021; Cao et al., 2024; Delis et al., 2021; Kisgen, 2006; Vink et al., 2021; Wojewodzki et al., 2020). Thus, it has fuelled extensive research on the drivers of credit rating. (Adams et al., 2003; Al-Gasaymeh, 2016; Gray et al., 2006; Guedes & Opler, 1996; Jiang & Packer, 2019; Mutize & Nkhalamba, 2020; Nguyen et al., 2020a; Opler et al., 1999; Oskonbaeva, 2020; Teixeira et al., 2018). For instance, a recent body of literature indicates that corporations are keener on credit ratings when it comes to financial decisions (Cho et al., 2020; Slapnik and Lončarski, 2023), leases (Bendig et al., 2017; Lim et al., 2017), firms' financial reporting quality (Alissa et al., 2013; Chiang et al., 2023; Hill et al., 2019; Lee & Schantl, 2019; Liu et al., 2018; Zhang, 2020; Zhang, 2018), and corporate governance (Allaya et al., 2022; Ashbaugh-Skaife et al., 2006; Mali & Lim, 2016).

Previous studies in the Anglo-American environment suggest that managers disclose firm-level information to enhance their companies' credit ratings (Basu et al., 2022; DeBoskey & Gillett, 2013; Gillette et al., 2020; He, 2018; Heflin et al., 2011;Oh & Park, 2017). For instance, Basu et al. (2022) document that variations influence firms' voluntary disclosure in credit ratings; these firms provide more voluntary disclosure following downgrading and less disclosure, resulting in upgrades due to the regulatory role of credit ratings. At the same time, He (2018) claimed that managers might release good news selectively to ensure that rating agencies are unlikely to verify the reliability of the disclosed information. This view suggests that managers might opportunistically use their voluntary disclosure as a mechanism through which they can enhance their companies' credit ratings. Hence, rating agencies should devote sufficient attention to the quality of voluntary disclosures as key determinants of firms' credit ratings. Accordingly, the first question we pose in this study is as follows. Is firms' voluntary disclosure quality associated with credit rating?

The current literature concerning the association between voluntary disclosures and credit ratings offers inconsistent findings (Basu et al., 2022; Botosan, 1997; Francis et al., 2008; Bonsall & Miller, 2017; He, 2018). For example, companies with higher credit ratings are less likely to reveal favorable financial information (DeBoskey

& Gillett, 2013; Gillette et al., 2020; He, 2018; Heflin et al., 2011), whereas Elamer (2017) identified a positive correlation between banks' risk disclosure and credit ratings, underscoring the significance of risk disclosure in mitigating information asymmetry. Grassa et al. (2020) indicated that banks with better credit ratings exhibit more comprehensive risk disclosures. Nevertheless, previous studies mainly concentrated on the quantity (level) of disclosures. Therefore, unlike previous studies, our research contributes to the existing literature by investigating the influence of the *quality* of voluntary disclosures on credit ratings.

Additionally, previous studies indicate that credit ratings are influenced not just by voluntary disclosures but also by audit quality, which serves as a proxy for required disclosures (Cha et al., 2016; Lim & Mali, 2020; Moalla & Baili, 2019; Vanhaverbeke et al., 2024). Research on the impact of audit quality across different countries is scarce, mostly concentrating on Korea (Cha et al., 2016) and Tunisia (Moalla & Baili, 2019). This study investigates the influence of audit quality on banks' credit ratings in various nations. Based on Wardhani (2019), we claim that audit quality improves the reliability of voluntary disclosures, leading to our second research question: *Can audit quality influence banks' credit ratings in emerging economies?*

Our motives for examining this relationship in the MENA region are as follows: First, previous studies on the relationship between disclosure and bank credit rating have not considered banks' cultural and religious environment. Unlike the Anglo-Saxon environment, where formal institutions mainly influence firm-level decisions and disclosure practices (García-Sánchez et al., 2016; Ghazwani et al., 2024; Gerged et al., 2023; Salem et al., 2023; North, 1994), studies suggest that the religious environment of MENA affects the quality of disclosed firm-level information (Abdelsalam et al., 2021; Salem et al., 2023b), with a likelihood of differential effect on the relationship between voluntary disclosure and bank credit rating. Secondly, despite the influence of religious social norms on the region, Sarhan and Ntim (2019) reported differences in voluntary disclosure across countries in the MENA region, suggesting variation in the magnitude of their effect on firms' practices. Therefore, it is important to examine the impact of disclosure on bank ratings in this region. Earlier studies in the Anglo-Saxon environment considered only conventional banks (DeBoskey & Gillett, 2013; Gillette et al., 2020; He, 2018; Heflin et al., 2011). Our study considered both Islamic and conventional banks with headquarters in the region to reflect the

impact of the religious environment on their corporate practices. Finally, some studies have emphasized that credit rating cannot only be determined by voluntary disclosure quality and suggested the role of audit quality as a proxy for the quality of disclosures (Lim & Mali, 2020; Lim et al., 2017; Moalla & Baili, 2019). Also, the literature suggests that national culture (Diallo, 2021; Eltweri et al., 2021) and regulatory environment (Zureigat, 2015) influence auditing practice in individual countries in the MENA region. For instance, some countries, such as Saudi Arabia and Egypt, have international standards of auditing based on IFRS, which may affect the quality of audits, unlike those with a less comprehensive approach. The literature also documented evidence of variation in the audit quality of firms in MENA as a result of differences in corporate governance quality (Ben-Hassoun et al., 2018; R. Salem et al., 2021; Sarhan & Ntim, 2019) and limited transparency in the audit process (Sarhan & Ntim, 2019).

Against this backdrop, we examine the impact of voluntary disclosure and audit quality on bank credit rating using hand-gathered data spanning 1590 bank-year observations across 17 countries from the Middle East and North Africa (MENA) region between 2006 and 2020. We found that the quality of voluntary disclosure has a significant and positive impact on the credit rating of Islamic and conventional banks. The quantity dimension of disclosure has no impact on the credit rating; however, the spread and usefulness of disclosed information positively and significantly affect the bank rating. In addition, audit quality substantially influences the credit rating of Islamic banks compared with those of their competitors.

Our study contributes to the international accounting literature in several ways. *First*, prior studies have examined the impact of the extent (*level*) of disclosures on credit ratings (Elamer, 2017; Gillette et al., 2020; Grassa et al., 2020; He, 2018). Thus, our study extends the extant literature by examining the impact of the quality of voluntary disclosures on credit ratings, using three different dimensions, namely, *quantity*, *spread* and *usefulness* of the information. This thorough method acts as a strong indicator of disclosure quality, facilitating an in-depth examination of the patterns and characteristics of disclosure quality. *Second*, our study also contributes to the international accounting literature by examining the impact of audit quality on credit ratings of both Islamic and conventional banks in a cross-country context. Our empirical findings provide practical implications for the policymakers and managers in emerging countries' financial institutions, especially in the Middle East and North

Africa. *Finally*, we contribute to the existing literature by examining the collaborative impact of voluntary disclosure and audit quality on bank credit ratings within the MENA region, a context defined by the interaction of formal and informal institutions (Abdelsalam et al., 2021; Satt & Iatridis, 2024). This dual influence establishes a unique institutional context, influencing firm-level disclosure and governance practices. By emphasizing this under-explored region, we offer novel insights into the influence of institutional dynamics in MENA on banks' credit ratings, thereby filling a significant gap in cross-country credit rating research.

The remainder of the article is structured as follows: The next section provides the institutional background. Section 3 reviews prior studies that have explored the impact of voluntary disclosure and audit quality on banks' credit ratings and develops the main research hypotheses. Section 4 outlines the research methods, and Section 5 shows the empirical results. Section 6 provides conclusions, implications, and limitations.

2 Institutional background

The institutional environment of MENA countries is unique and provides an interesting setting for our study for several reasons. First, these Arab and Muslim-majority countries share numerous cultural commonalities in variable degrees (Hofstede et al., 2015). For instance, the prevalence of the Islamic religion in this region is linked to the dominance of Islamic banks, as Bahrain, Saudi Arabia, and UAE are among the top 5 developed countries in terms of Islamic finance (ICD-Refinitiv Report, 2020). Second, the Western influence on MENA countries is profoundly ingrained in their legal, educational, and economic frameworks, influenced by historical connections to previous colonial powers (Salem et al., 2021). Crucially, business cultures in these countries are hugely influenced by either a British culture, such as in Saudi Arabia, Egypt and Jordan or French heritage, e.g., in Morocco, Algeria and Tunisia, due to the effect of colonization of these countries (See Akrout & Othman, 2013; Gerged, 2018). This means that conventional banks also prevail and perform significantly well in this region (Kharrat et al., 2024; Mahdi & Abbes, 2018; Mateev et al., 2022). Therefore, we argue that the banking sector of the MENA region, consisting of Islamic and conventional banks, performs exceptionally well and has been a keen area of research since the global financial crisis of 2008 (Mateev & Bachvarov, 2021). Third, the business environment in MENA countries is dominated by state ownership, as most

MENA countries are either monarchies ruled by the same families or have republic status after independence from Western countries. Thus, it can be argued that the state (public) ownership of banks, as a dominant ownership structure, makes the MENA region a unique context compared with other regions of the world, which might influence the drivers of banks' credit ratings in the region.

On the other hand, MENA countries are sufficiently heterogeneous on the basis of macroeconomic characteristics, which also makes this setting interesting for research. For example, the MENA region comprises both oil-based economies, such as Saudi Arabia, UAE, and Qatar, and non-oil-based economies, including Egypt, Jordan and Tunisia, which leads to various degrees of economic growth in these countries (Malik & Masood, 2021). Similarly, MENA countries have substantial variations related to political instability (Lassoued et al., 2018). For example, MENA countries that underwent the so-called Arab Spring, such as Syria, Libya, and Yemen, have witnessed high political instability. In contrast, other MENA countries, including UAE, Kuwait, and Qatar, are politically stable. Likewise, the level of compliance with different corporate disclosure regulations, such as disclosures under the Sharia Supervisory Board (SSB), varies across Islamic and traditional banks in the region (Elamer et al., 2020). These variations allow us to comprehensively analyse the potential roles of voluntary disclosure quality and audit quality in enhancing or hindering Islamic and traditional banks' credit ratings across a selected sample of MENA economies.

3 Review of literature

3.1 Quality of Voluntary Disclosure and Credit ratings

Investors view voluntary disclosure as one of the essential types of non-financial information. Because voluntary disclosures are mostly narrative and public in nature, accuracy and certainty are critical to avoid disclosures becoming boilerplate and losing their value (Bozzolan and Miihkinen, 2021). Previous literature indicates that voluntary disclosure quality is an important mechanism through which management can affect credit ratings (Akorsu, 2023; Basu et al., 2022; Cao et al., 2024; Crabtree & Maher, 2012; Elamer et al., 2020; Grassa et al., 2020; He, 2018; Oh & Park, 2017). According to Vanhaverbeke et al. (2024), public disclosures generally impose a more significant influence on credit ratings than private information since credit analysts are likely to

prioritize unfavorable public information when modifying their risk evaluations. This underscores that public disclosures can substantially impact credit ratings more than private disclosures. High-quality public disclosures are expected to associate positively with credit ratings, highlighting the significance of transparency and accuracy in the information presented. Similarly, DeBoskey and Gillett (2013), He (2018), and Elamer et al. (2020) underscore the essential function of comprehensive public disclosures in improving enterprises' creditworthiness and analysts' risk evaluations. In his investigation of the association between voluntary disclosure quality and credit capital cost, Sengupta (1998) found that analysts' ratings of firms' disclosure policies assist and explain bond yields and credit ratings. Sengupta (1998) also states that a better quality of voluntary disclosure appeared to signal that a firm's managers might withhold unfavorable news about its creditworthiness. Another study by Francis et al. (2005) supported the notion that corporate disclosure quality is related to better credit ratings and lower interest costs. From a different perspective, Mazumdar and Sengupta (2005) argue that voluntary disclosure quality can decrease the spread of private debt. Voluntary disclosure quality, from the point of view of Yu (2005), is positively related to the spreads of secondary-market bond yield. Bharath et al. (2008) also find better voluntary disclosure quality is attributed to lower interest costs and bank debt. Heflin et al. (2011) investigated the impact of disclosure channels and credit ratings, indicating a positive relationship between annual report disclosures' quality and credit ratings among a sample of US firms. Hui and Lui (2012) investigated managers' voluntary disclosure during credit watch periods in US firms, and findings suggest that managers' voluntary disclosure increases during credit watches. DeBoskey and Gillett (2013) claimed that credit rating is significantly associated with disclosure information transparency in US firms and markets. He (2018) investigated whether a voluntary disclosure is considered an instrument by which managers control credit ratings, linking companies close to a rating change with a higher occurrence of product and business expansion plan disclosures. Recently, Basu et al. (2022) analyzed the impact of credit ratings on firms' voluntary disclosure behavior and found that firms provide more voluntary disclosure following downgrading and less disclosure, resulting in upgrades of their credit ratings.

Prior research on the financial sector claimed that the extent of disclosures is positively associated with credit ratings (Elamer, 2017; Grassa et al., 2020). More relatedly, Elamer (2017) shows a positive association between risk disclosure and credit ratings of banks, suggesting that increased transparency in risk disclosure is a tactic implemented by managers to decrease the asymmetric gap of information, signaling banks' quality and future prospects to the market. Most recently, Grassa et al. (2020) document a positive influence of banks' credit rating on conventional banks' risk disclosure compared to their Islamic banks' competitors. They argued that the reason behind this finding is that Islamic banks disclose less risk information than conventional banks due to the nature of business risk. From an agency theory perspective, credit rating agencies mitigate the agency conflicts between companies' management and other stakeholders by efficiently using the companies' disclosed information (Core, 2001; Hui & Lui, 2012). Jorion et al. (2005) argue that after the Securities and Exchange Commission (SEC) had implemented the regulation of fair disclosure on October 23, 2000, in the US, rating agencies were given access to managers' confidential information, which was not available to the other stakeholders of the companies. By having this access, the rating agencies are expected to highlight the bias in the voluntary disclosures during credit watch or rating of companies (Basu et al., 2022; Oh & Park, 2017). Kim and An (2021) claimed that high-quality disclosure, defined by its relevance, faithful representation, and timeliness, is critical in enabling rating agencies to estimate a company's default risk and future performance accurately. Thus, we argue that high-quality voluntary disclosure (characterized by transparency and completeness) enables credit rating agencies to better assess a bank's risk, which can positively affect the bank's credit rating. This aligns with agency theory, where increased transparency through high-quality disclosures helps reduce informational conflicts among stakeholders and thereby fosters better credit ratings. Based on this argument and the findings of related prior studies (e.g., DeBoskey & Gillett, 2013; He, 2018; Heflin et al., 2011), we hypothesize that higher-quality voluntary disclosure, which encompasses both transparent and comprehensive information, is positively associated with a bank's credit rating. Hence, we formulate the following hypothesis:

> **H_1**= *High-quality voluntary disclosure positively influences the credit rating of both Islamic and non-Islamic banks.*

3.2 Auditor choice and credit ratings

According to audit literature, several studies have shown compelling evidence that Big-4 companies deliver superior quality auditing because of their higher reputation and lawsuit risk, as well as the better skills of Big-4 auditors (Bozzolan and Miihkinen, 2021; Defond & Zhang, 2014; Lennox & Pittman, 2010; Komal et al., 2023). Prior research also indicated that external audit reputation certainly matters for big audit firms (Usman et al., 2022; Usman et al., 2023) and is welcomed by the audit committee (Bilal et al., 2023; Bilal et al., 2024; Komal et al., 2022; Komal et al., 2023). Audit reputation is associated with higher voluntary disclosure quality and plays a crucial role in reducing information asymmetries between corporate managers and stakeholders (Ahmadi & Bouri, 2019; Chalmers & Godfrey, 2004; Wardhani, 2019). Crucially, Big 4 auditors provide insurance protection, affecting debt pricing in public firms (Mansi et al., 2004; Pittman & Fortin, 2004). In this context, Fortin and Pittman (2007) investigate the relationship between Big 4 auditors and credit ratings in US private firms and fail to find a significant association. Likewise, Dedman and Kausar (2012) also failed to find a relationship between the Big 4 auditors and credit ratings in the case of UK private firms. In the case of public companies, nevertheless, Strickett and Hay (2015) and Strickett et al. (2022) document that going concern opinions issued by the Big 4 auditors are linked with companies' credit ratings. Zalata et al. (2020) and Moalla and Baili (2019) fail to find a relationship between the Big 4 auditors and credit ratings. Recently, Akorsu (2023) found that previous evidence is inconclusive, implying an ongoing debate regarding the relationship between the big 4 auditors and credit ratings. Our study, therefore, adds to this debate by providing new insights into the relationship between auditor choice and credit rating of banks operating in the MENA region.

Theoretically, Big 4 auditors and credit rating agencies can play a critical role in alleviating agency conflicts between agents (managers) and (principles) shareholders (Moalla & Baili, 2019). As a result of information asymmetry issues, stakeholders increase their demands for information (voluntary disclosures) from the market intermediaries, including credit rating agencies and independent auditors (Ashbaugh-Skaife et al., 2006). The selection of highly reputable and qualified auditors may contribute to more efficiency in addressing contracting problems by lowering information risks about borrowers (Jensen & Meckling, 1976). In a consistent view,

Ahmadi and Bouri (2019) claimed that Big4 auditors' clients are likely to publicly disclose more financial and non-financial information. Based on this argument, we expect a positive relationship between Big 4 auditors and credit ratings as Big 4 auditors consider the credit ratings while giving their opinions (Strickett et al., 2022). Therefore, we hypothesized that:

> **H_2 =** *Big-4 auditors are positively associated with the credit rating of both Islamic and non-Islamic banks.*

3.3 Joint Audit and Credit Ratings

Some corporations deal with two or more audit companies to strengthen external auditors' independence. The selection of two different auditors rather than one indicates '*good news*' to the market (Teoh et al., 1998; Titman & Trueman, 1986) about the disclosure quality of the client firm. Two reasons can justify the use of joint audits. First, as mentioned earlier, financial statement users, such as lenders, believe that two auditors at once are less likely to accede to a client's pressures, which signals a higher assurance value. Second, drawing on the 'insurance hypothesis', audits are likely to add value by offering indirect insurance to investors (Wallace, 2004). In audit failure scenarios, investors can prosecute auditors for compensating their losses if a credit loss relates to misleading financial information. In this regard, Zerni et al. (2012) document that companies opting voluntarily for joint audits have better credit ratings in the voluntary Swedish joint audit setting. Recently, Ahmadi and Bouri (2019) found a positive influence of joint audits on the voluntary disclosure index in the Tunisian context. As a governance mechanism, the audit's most crucial role is to diminish the asymmetric gap of information between shareholders or third-party contractors and managers. Thus, we expect that credit rating agencies perceive joint audits of banks as an indicator of a high-quality audit, which is expected to enhance the banks' credit ratings. Therefore, we hypothesize that:

> **H_3=** *Co-audit is positively associated with Islamic and non-Islamic banks' credit ratings.*

3.4 Audit Opinion and Credit Ratings

Although credit rating agencies and auditors deliver a similar public service to stock markets, including audit opinion and credit rating, a few studies examined the

association between credit rating and auditor opinion (Cha et al., 2016; Feldmann & Read, 2013; Funcke, 2015; Moalla & Baili, 2019). For example, Feldmann and Read (2013) and Funcke (2015) examined the influence of credit ratings on auditors' decisions in the US setting. Their empirical evidence shows that low credit rating firms are expected to be given a going-concern judgment. Likewise, Feldmann and Read (2013) provided evidence suggesting auditors tend to be more conservative when S&P's rating is nearer to default and that a credit rating implies low solvency outcomes in a more critical assessment. Also, Funcke (2015) shows that credit rating affects auditors' decisions by including further information that enables more accurate and transparent decisions.

Similarly, Cha et al. (2016) examined the relationship between credit ratings and auditors' opinions on financially distressed firms in Korea. They found a negative association between credit rating and the modification of going-concern. Recently, Moalla and Baili (2019) investigated whether credit ratings offered by Fitch can predict auditors' opinions for a selected sample of Tunisian financial institutions. They found that firms with low ratings are likely to obtain a modified audit opinion. Besides, Strickett et al. (2022) reported that the chances of a going-concern opinion are associated with one month prior to credit ratings issued by S&P and Moody rating agencies. Using a sample of companies that filed for bankruptcy, they claimed that S&P and Moody rating agencies had downgraded almost 68% and 24% of companies after one month of going-concern opinion, respectively. Thus, auditors consider the companies' credit ratings when making their opinions because of the estimated lower audit fees linked with a going-concern opinion. In case of poor credit rating, the company's auditor is in a position to issue a going-concern opinion without hesitation. In existing studies, however, there is no evidence of the credit rating-audit opinion nexus in the banking sector. Therefore, we extend the current literature by examining the potential impact of audit opinion on banks' credit rating in emerging economies. Based on the above discussion, we hypothesize the following.

H_4= *the going-concern audit opinion is related to Islamic and non-Islamic banks' credit ratings.*

4 Data and Methodology

4.1 Sample selection

We gathered the financial data from DataStream, credit rating data from S&P and FitchConnect, and hand-collect the voluntary disclosure data from banks' annual reports. The credit-rating scores were obtained from two international credit rating agencies, which are Fitch and Standards and Poor's. Our sample covers all Islamic and conventional banks operating in 17 emerging countries[1]. Since Islamic banks implemented IFRS in 2006, our sample utilizes annual data over 15 years from 2006 to 2020. The inclusion of data covering the COVID-19 period (2021 and 2022) may introduce confounding variables, potentially leading to skewed results or conclusions. Consequently, to ensure the reliability and validity of our findings, we have deliberately restricted our focus solely to data up to the year 2020. The MENA region was selected because it obtained the second-place ranking in terms of banking sector growth (Salem et al., 2021), characterized by a large number of Islamic banks (Maatoug et al., 2019), and witnessed political turmoil exacerbated by the Arab Spring (Abdelsalam et al., 2016). Also, the economy of the MENA region is characterized by either oil or tourism revenues. As well, leverage, bank size, and asset tangibility are almost comparable throughout the region (Salem et al., 2021). Most crucially, MENA countries have witnessed rapid and fluctuating credit growth rates, raising concerns about the financial system's stability, especially given the assumption that any increased credit growth is likely to be followed by financial crises (Bitar et al., 2016; Crowley., 2008). Additionally, the MENA region attracts investors and bankers worldwide because it links developing and developed countries in Africa, Asia, and Europe (Bitar et al., 2016). As a result, examining the drivers of banks' credit ratings in this region has implications far beyond its borders. Furthermore, the findings of this study may aid regulators and policymakers in enhancing macroeconomic bank governance by establishing rules and regulations to promote bank performance, transparency, and competition. We carefully revised the data for the entire period to ensure data availability and reduce discrepancies. Thus, banks with insufficient data regarding credit ratings, voluntary disclosure, and audit quality were excluded from the sample. Our final sample consists of 435 and 1155 bank-year observations that apply

[1] These countries include; Kuwait, Lebanon, Palestine, Oman, Egypt, Qatar, Morocco, UAE, Syria, Iraq, Yemen, Tunisia, Bahrain, Israel Jordan, Saudi Arabia and Iran.

Expects Data Sharing: The authors confirm that all data underlying the findings and any other supporting information are available on request.

to Islamic and conventional banks for our empirical analyses, respectively (see Table 1).

4.2 Credit rating measurement

The credit rating agencies have a critical function in affecting the debt holders' decisions because the given rate (score) reflects the agency's assessment of banks' ability to pay their outstanding obligations on time and in full. In this respect, our dependent variable is the credit rating score given by those agencies based on the banks' creditworthiness with respect to their long-term debt obligations. The highest rating score is AAA (Prime), and the poorest rating score is D (in Default). Following prior studies, firstly, we converted the credit ratings into seven categories that convey systematic risk assessments (Boumparis et al., 2019; Grassa et al., 2020; Hui et al., 2020; Oh and Park., 2017). Respectively, a value of 7 is given to banks with the highest credit rate (AAA), and a value of 1 is given to banks with the lowest credit rate (***D, C, CC, CCC, CCC+***). Therefore, each group is mapped into a series of credit ratings as follows: Rating Group **7**: AAA, Rating Group **6**: AA-, AA, AA+, Rating Group **5**: A-, A, A+, Rating Group **4**: BBB-, BBB, BBB+, Rating group **3**: BB-, BB, BB+, Rating Group **2**: B-, B, B+, Rating group **1**: D, C, CC, CCC, CCC+. We used an additional credit rating measure to ensure our findings' reliability. Particularly, we followed Oh and Park (2017) by using an indicator variable that is equal to 1 if the credit rating level is in the range of "A– to AAA" and 0 otherwise. This measurement mirrors the assessment given by those attracted to the information disclosed about the bank's fundamentals, that is, bondholders and credit-rating agencies. The speculative grade and investment grade were used as a classification scheme in order to facilitate the discussion of the economic importance of the regression outcome.

4.3 Quality of Voluntary Disclosure Measurement

We adopted the same framework as Salem et al. (2020) to obtain the quality of information disclosed voluntarily in the annual reports through three dimensions: quantity, spread, and usefulness. This approach covers the disclosed information's quantitative and qualitative features (Salem et al., 2020). We hand-collected the voluntary disclosure information from the annual reports of 1590 bank-year observations across 17 emerging countries from 2006 to 2020. The measurement of each dimension is explained in the following section:

4.3.1 Quantity Dimension

The first dimension focuses on the quantity (level) of the information disclosed each year by adjusting the amount disclosed by bank type and size. The disclosure level is directly impacted by the business's size and complexity (Rezaee and Tuo, 2019; Salem et al., 2020). Therefore, we take into account the variation in size and bank type to ensure the effectiveness in estimating the quantity of disclosure (Q_STR) dimension (Beretta and Bozzolan, 2008). Although some MENA countries comply with the Basel I agreement regulations, others decide not to comply with some requirements and prefer not to disclose every mandatory information (Alber and Ramadan., 2022; Bitar et al., 2016). Consequently, we designed a comprehensive disclosure index containing all elements still contested and should be provided at least voluntarily to fulfill investors' expectations. Following Adelopo et al. (2021), Hassan and Marston (2019), and Salem et al. (2020), a content analysis approach with an index that consists of voluntary disclosure items relevant to banks operating in MENA is adopted (see Appendix A). Consequently, the number of words is adjusted by bank size, and type is used to measure the Q_STR dimension. Following Beretta and Bozzolan (2008) and Salem et al. (2020), the OLS regression[2] was employed to estimate the quantity dimension proxy. We computed R_Q by subtracting the residual (anticipated transparency) from the overall frequency of revealed elements.

The following is the standardized formula:

$$Q\_STR_{it} = 1 - \frac{\text{Max\_R\_Q} - \text{R\_Q}_{it}}{\text{Max\_R\_}Q - \text{Min R\_Q}}$$

Where:

Q_STR_{it} = standardized relative quantity index for the bank *i* at year *t*.

R_Q_{it} = is the relative quantity index, which is the residual for the bank i at year t obtained after controlling the bank's size.

Max_R_Q and Min_R_Q represent the maximum and minimum residuals.

[2] We employed OLS regression to estimate the quantity of disclosure by controlling for bank size and type, as these factors significantly influence disclosure levels (Rezaee & Tuo, 2019; Salem et al., 2020). Specifically, the OLS regression was used to compute the residuals (R_Qit), representing the anticipated transparency of each bank. The standardized formula for Q_STR is derived by adjusting for these residuals, ensuring that the variation in size and type is accounted for. The residuals (R_Qit) from the OLS regression capture the difference between the observed and expected levels of disclosure for each bank-year observation. These residuals represent the unanticipated or relative disclosure quantity, adjusting for the influence of size and type. We then used these residuals in the standardization formula to calculate Q_STR, the standardized relative quantity index.

In the estimation of Q_STR, we control for both bank size and type. R_Qit represents the firm-specific residual for bank *i* in year *t*, while Max_R_Q and Min_R_Q are the maximum and minimum residuals across the entire sample. This approach ensures that the quantity of disclosure is standardized across the sample, allowing for valid comparisons between banks of different sizes and types. In cases where Max_R_Q is equal to R_Q, a standard value for Q_STR is applied to avoid undefined outcomes.

4.3.2 The Spread Dimension

This dimension concentrates on the dispersion (DISP_E) and the coverage (COV_E) of the information revealed by banks that should satisfy several stakeholders' desires (Salem et al., 2020). Following Beretta and Bozzolan (2008) and Beattie et al. (2004), we used the ratio of the information disclosed (items) from the overall number of items in the checklist as a proxy of coverage. Consequently, the greatest value (1) is awarded if each of the checklist's themes (sub-topics) is reported in the bank's annual report, while the lowest value (0) is assigned if no topics are disclosed. We employed the formula below to measure the coverage[3].

$$COV\_E_{it} = \frac{1}{st} \sum_{j=1}^{s} IN\_F$$

Where

IN_F = 1 if bank *i* revealed information about item *j* at year *t* and 0 otherwise. *s* is the number of subcategories. On the other hand, the dispersion (DISP_E) of items revealed in the annual report within the disclosure checklist is adopted to indicate the concentration. This method measures whether managers emphasize (signaling) certain items or offer a comprehensive and wide range of information within the checklist. We adopted the formula used by Salem et al. (2020) and Beretta and Bozzolan (2008) to measure the DISP_E:

$$DISP\_E_{it} = 1 - \sum_{j=1}^{n} H\text{-}j^2$$

Where;

H-j = is the ratio of revealed item *i* captured by the item disclosure frequency in category *j* at year *t*.

[3] A detailed explanation about the measurement of each dimension can be found at;

Beretta, S. and Bozzolan, S., (2008). Quality versus quantity: the case of forward-looking disclosure. *Journal of Accounting, Auditing & Finance*, 23(3), pp.333-376.

Beattie, V., McInnes, B. and Fearnley, S., (2004), September. A methodology for analysing and evaluating narratives in annual reports: a comprehensive descriptive profile and metrics for disclosure quality attributes. In *Accounting forum* (Vol. 28, No. 3, pp. 205-236).

Consequently, the average of DISP_E and COV_E is employed as a proxy for the spread dimension:

$$S\_PR_{it} = \frac{1}{2} (DISP\_E_{it} + COV\_E_{it})$$

4.3.3 The Dimension of Usefulness

To address the potential varying effects of revealed items on corporate credit ratings, we go beyond a binary coding technique. Alongside categorizing the existence or absence of disclosure items, we evaluate the quality of the given information based on the IFRS qualitative attributes of faithful representation, understandability, relevance, comparability, and timeliness (IFRS 2010; Salem et al., 2020). This multi-faceted strategy guarantees that the substance and nature of disclosures are sufficiently documented, illustrating their potential influence on stakeholder views, including credit ratings. By incorporating both quantitative and qualitative characteristics, we guarantee a thorough assessment of voluntary disclosures. To measure the usefulness dimension, we adopted Salem et al.'s (2020) index with a rating scale of five points (see Appendix B). However, timeliness is obtained through the natural logarithm of the number of days between the year-end and the auditor's signature. Consistent with Alotaibi and Hussainey (2016) and Salem et al. (2020), we employed the weighted technique of the qualitative characteristics as follows:

$$USE\_FU = \frac{1}{5} (\text{Faithfulness} + \text{Understandability} + \text{Relevance} + \text{Comparability} + \text{Timeliness})$$

To obtain the quality of voluntary disclosure (Q_VD), we used the following formula:

$$Q\_VD = \frac{1}{3} (Q\_STR_{it} + S\_PR_{it} + USE\_FU)$$

To ensure the validity of our overall measurement, our checklists were based on an analysis of international trends, relevant research studies, and observations of standard reporting practices (Lemma et al., 2020). Therefore, the specified items are considered relevant and more likely to be disclosed by banks. On the other hand, to confirm the reliability of the adopted disclosure index, we employed multiple coders[4] to score the research instrument. Then, the emerged coding scores were discussed

[4] Five coders were involved in this procedure to ensure the accuracy and uniformity of the scoring.

and compared, and variances were resolved accordingly (Alotaibi and Hussainey, 2016; Salem et al., 2020). Following Nekhili et al.'s (2017) argument, the market responds positively to the quality of disclosed information. We employed the market-based value (MBV)[5] to verify whether the captured disclosure relates to market reaction. Our untabulated results confirm that the quality of disclosed information is positively linked with MBV at a 1% level. This outcome aligns with the argument that high-quality information will likely help investors forecast banks' earnings in the subsequent year. Therefore, this experimental evidence supports the reliability and validity of the quality of voluntary disclosure measurement.

4.4 Audit quality measurement

Following previous studies (Ahmadi and Bouri., 2019; Hu., 2011; Salem et al., 2021; Wardhani, 2019), we used three audit quality proxies: Big-4, Co-audit, and audit opinion. Ahmadi and Bouri (2019) indicated that a big-size audit firm (Big-4) enhances the disclosure quality, decreasing the asymmetric information gap between directors, stockholders, and other regulatory bodies such as credit agencies. Stockholders expect big audit firms (Big-4) to be able to fulfill professional audit quality since they have superior resources and reputations. Therefore, ***Big-4*** is measured by employing a dummy variable which takes the value 1 if a Big-4 company audits the bank and 0 otherwise.

Additionally, Ahmadi and Bouri (2019) and Salem et al. (2021) illustrate that the cooperation of two audit firms confirms the audit quality in terms of competence and independence, which in turn reduces any possible control of auditees. Therefore, the existence of the two audit firms increases audit independence and reduces possible collusion between auditors and managers. Consequently, we measured ***Co-audit*** using a dummy variable that takes the value of 1 if two audit firms audit a bank and 0 otherwise. In addition, going-concern audit opinion is used as a signal of audit quality to stockholders and regulatory bodies. Moalla and Baili (2019) and Siregar et al. (2020) demonstrate that external auditors provide going-concern audit opinions if the firm cannot pay its obligations and cannot maintain its business continuity, which, in turn, affects its credit rating. Thus, we measured the going-concern audit opinion (***A-Opin***)

5 MBV= it is calculated using the aggregate of both earnings per share (EPS) and Tobin's Q

using a dummy variable that takes the value of 1 if an auditor issued a going-concern opinion and 0 otherwise.

4.5 Empirical model

Our study applied the following model to investigate whether the quality of voluntary disclosure and audit quality influence the credit rating of both Islamic and conventional banks. We used equation (1)[6] for the full sample and two subsamples (conventional and Islamic banks) independently since directors' incentives vary from their needs and the ability towards voluntary disclosure and upholding their credit rating.

$$CR_{it} = \beta_0 + \beta_1\ Q\_VD_{it} + \beta_2\ A\_Q_{it} + \beta_3\ \text{Audit Committee Characteristics}_{it} + \beta_4\ \text{Bank\_Characteristics}_{it} + \beta_5\ \text{Bank-type} + \beta_6\ \text{Country\_effect}_{it} \quad (1)$$

Where;

CR is the dependent variable which is the assigned score by the credit rating agencies to bank *i* in year t. ***Q_VD$_{it}$*** and ***A_Q$_{it}$*** represent the quality of voluntary disclosure value and audit quality proxies as defined in Appendix *1*. The audit quality proxies (***A_Q$_{it}$***) include ***Big_4***, ***Co-audit***, and ***A-Opin***.

Additionally, we included Audit Committee Characteristics (IAC, ACZ, and ACM), which may have a potential association with enhancing both the quality of voluntary disclosure and banks' credit rating. ***IAC*** is measured as the number of independent directors on the audit committee scaled by the total number of audit committee members, ***ACZ*** represents the size of the audit committee, and ***ACM*** represents the total number of audit committee meetings held in a financial year.

Based on prior research (Alali et al., 2012; Ahmadi and Bouri, 2019; Basuet al., 2017; Grassa, 2016; Grassa et al., 2020; He., 2018; Oh and Park, 2017; Siregar et al., 2020; Sahyoun and Magnan., 2020; Tepalagul and Lin, 2015; Wardhani, 2019), several control variables at the bank and country levels were adopted, which may influence the associations among voluntary disclosure quality, audit quality, and credit ratings. In particular, we considered six bank-level factors to control for the cross-

[6] appendix 1 shows the measurement, definitions and source of all study variables used in the model.

sectional variances in bank characteristics. We isolated the effect of ***bank size*** following Salem et al. (2020) and Salem et al. (2021) and used the natural logarithm of total assets as our measure of bank size. We also controlled for firm ***leverage*** to account for the impact of gearing on disclosure practices. Following previous studies (Ezeani et al., 2022), we measured leverage as total liabilities divided by total assets. We also accounted for ***growth*** among banks in our sample and measured growth as the change in total assets scaled by the lag of total assets. Previous studies suggest that profitability influences banks' corporate disclosure (Salem et al., 2023a; Salem et al., 2021). We, therefore, controlled for ***profitability*** using net income scaled by the lag of total assets as its measure. To measure banks' capital in relation to their risks, we include the ***capital adequacy ratio*** that represents the proportion of actual regulatory capital (Tier 1 capital) divided by the total assets. Empirical studies documented a link between bank liquidity and its rating (Shen et al., 2012; Varotto, 2011). Therefore, we controlled for ***liquidity***, which was measured as current assets scaled by current liabilities. Furthermore, we included Bank-type when examining the full sample to differentiate between Islamic and conventional banks and to test its impact on the association between CR and Q_VD. ***Bank-type*** is a dummy variable that assigns 1 to Islamic banks and 0 to conventional banks. In addition, many MENA nations, including Tunisia, Yemen, Egypt, Syria, and Iraq, suffered political turmoil in 2011, which significantly affected their economy (Salem et al., 2021). Since our sample consists of banks operating in countries experiencing political problems, we followed Abdelsalam et al. (2016) and controlled for country-specific effects from 2011 to 2016. Consequently, the political turmoil variable (***PT***) is created and measured as a dummy variable that takes the value of 1 if a bank is based in Egypt, Yemen, Syria, Tunisia, or Iraq and 0 otherwise.

Our analysis employed two types of credit rating measures as dependent variables: a seven-category credit rating scale (ordinal) and a binary indicator for investment grade (Grassa et al., 2020; Oh and Park, 2017). We utilized an ordered logit panel regression model for the ordinal measure to accommodate the ordered characteristics of the credit rating variable (CR2). We employed a logit panel regression model for the binary classification (CR1), suitable for dichotomous outcomes (Grassa et al., 2020). These models guarantee that the statistical methods correspond with the characteristics of the dependent variables, therefore yielding

robust and dependable results. Following Usman and Tandelilin (2014), a Chow test is adopted to identify whether panel or pool regression is suitable for our model and dataset. We found that F statistics is significant at the 1% level for the full sample and subsamples (Islamic and conventional banks). This finding approves the suitability of panel data regression. Furthermore, we used the Hausman specification test to identify whether fixed or random effects regression is the most suitable approach for our sample. The result (untabulated) confirms that the random-effects model is the most appropriate method (Prob > Chi2 = 0.1121 and 0.1123) for our dataset.

The operational and governance frameworks of Islamic and conventional banks exhibit substantial differences, especially regarding disclosure and audit practices (Salem et al. 2021). IBs operate under Shariah rules, which mandate ethical responsibilities for their financial activities (Elnahass et al. 2014), affecting both the quality of their disclosures and their auditing techniques (Abdallah et al. 2015). In contrast to traditional banks, which promote financial disclosure aimed at maximizing shareholder value, IBs are also required to adhere to religious and ethical standards (Lassoued et al., 2018; Farook et al., 2014). This results in greater transparency and enhances voluntary disclosure, particularly concerning governance and social responsibility (Farook et al., 2014). Additionally, IBs engage in dual audits: one for financial reporting and another for Shariah compliance, regulated by Shariah supervisory boards. The audit quality in IBs is consequently more stringent since it integrates both financial efficiency and compliance with religious norms (Grassa, 2015). The incorporation of external auditors, including Big-4, and the integration of ethical auditing procedures enhance the overall audit quality in IBs compared to their conventional counterparts (Salem et al., 2021). The unique governance processes of IBs foster the perception of them as more risk-averse and ethically accountable, underscoring the necessity for a comparative analysis between IBs and NIBs in research concerning financial reporting, governance, and credit ratings.

5. Empirical results and discussion

5.1 Sample statistics

Table 2 reports the credit rating distribution of all available bank-year observations over the entire sample, conventional and Islamic banks. The A grade (seen in Table 2) is a cut-off point to differentiate whether the bank is assessed highly in the market

or poorly. Among the total 1590 bank-year observations, 493 observations (31%) have a credit-rating grade equal to or greater than 'A–' in the entire sample. However, 59% of Islamic bank observations have a higher credit rating than 20% of those conventional banks. This result suggests that the unique governance structure of Islamic banks might have improved their credit rating. However, Table 3 (panels A, B, and C) shows the credit rating distribution over the entire sample, conventional and Islamic banks, sorted by year, respectively. The summary statistics in the three panels show a fluctuation in the banks' credit rating levels after the financial crisis. This finding is in line with those reported by Reusens and Croux (2017), who indicated that the credit rating agencies had poorly judged the significance of the diverse determinants of credit rating with respect to default risk before the crisis and permanently adjusted their rating methodology after 2009 (Kiff et al., 2010).

Insert Table 2

Insert Table 3

5.2 Descriptive statistics

Table 4 illustrates the descriptive statistics with respect to conventional and Islamic banks. The mean values of CR1 and CR2 as proxies for credit rating are 25%, 3.84, 66%, and 4.48 in conventional and Islamic banks, respectively. This finding suggests that Islamic banks are highly rated (evaluated) compared to their competitors. This favorable rating could be attributed to compliance with Shariah law and the existence of the Shariah board in Islamic banks, which have an efficient monitoring mechanism that ensures the capacity of the bank to satisfy its financial obligations (Grassa, 2015). These outcomes align with Grassa et al. (2020) and Grassa (2015). On average, the mean value of Q_VD in conventional banks is slightly higher than that of Islamic banks by 2%. Our result is consistent with Grassa et al. (2020) and Grassa et al. (2019). However, our result is 40% higher than that of Ghosh (2018), who investigated the level of disclosure in MENA banks from 2000 to 2012. This inconsistency could be attributed to the implementation of IFRS post-2006 (Elnahass et al., 2014) and the difference in the method used to capture the quality of disclosed information.

Regarding audit quality, Table 4 reports that the mean values of Big-4, Co-audit, and A-Opin are (72%, 57%, 4.9%) and (54%, 36%, and 4.7%) in Islamic and conventional banks, respectively. These outcomes indicate that the audit quality of Islamic banks is higher when compared with its competitors and in line with prior studies (Salem et al., 2021; Inaam and Khamoussi., 2016).

Table 5 presents the outputs of the variation in the mean values of the main variables using inferential statistic tests and additional non-parametric (Wilcoxon signed ranks). The comparison tests show a significant difference in the mean values of the credit rating proxies between conventional and Islamic banks at a 1% level. Consistent with Grassa et al. (2020), our findings suggest that Islamic banks are highly valued (ranked) compared with their competitors. This outcome is in line with the argument that ethically, religiously, and socially responsible banks show risk aversion (Salem et al., 2021) and are more likely to meet their financial obligations (Grassa, 2015).

On the other hand, the mean values of Q_VD are significantly different at a 1% level and slightly higher in conventional banks compared with Islamic banks. Our findings are consistent with previous studies (Grassa et al., 2020; Grassa et al., 2019). The mean values of Big-4 and Co-audit as proxies for audit quality show a significant difference at a 1% level and higher in Islamic banks compared with their traditional counterparts, while A-Opin has an insignificant difference. This outcome aligns with the argument that Islamic banks' docility by the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) framework improves the quality of their financial reporting and financial performance.

Table 6 describes the correlation matrix between the study variables. Consistent with Gujarati and Porter (2009). The correlation coefficients of all explanatory variables in Islamic and conventional banks are below the conventional threshold, confirming the absence of a multicollinearity issue.

Insert Table 4

Insert Table 5

Insert Table 6

5.3 Regression results:

Table 7 reports the relationship between CR, Q_VD, and AQ for the entire sample, as well as conventional and Islamic banks, respectively. We used Panel regression to examine the predicted association between the study variables and satisfy the exogeneity and the relevance conditions. In this regard, the Random-effects model is employed due to an insignificant P-value of the Hausman specification test (Salem et al., 2020). As expected in **H_1**, **H_2**, and **H_3**, high quality of disclosed information, Big-4 and Co-audit (as proxies for audit quality) are positively associated with the credit rating of both conventional and Islamic banks. Unlike the audit opinion (**H_4**), which has an insignificant impact on the credit rating. Our results suggested that banks with high-quality disclosure, audited by big-4 and an extra professional audit firm, are more likely to meet their long- and short-term obligations (Grassa, 2015). Our findings are consistent with those results reported by Salem et al. (2020) that audit quality enhances the financial reporting quality, and corporate disclosure is positively linked with credit rating (Grassa, 2020).

Regarding the control variables, IAC and ACM have a positive association with improving banks' credit rating in both Islamic and conventional banks. In contrast, ACZ, bank size, and LIQ have insignificant links with credit rating in Islamic Banks. Furthermore, the bank type variable is positively attributed to bank credit rating across the entire sample. This finding corroborates the outcome of Table 5, indicating that Islamic banks are highly ranked and well regarded compared to their traditional counterparts (Grassa et al., 2020; Salem et al., 2021).

Insert Table 7

We also investigated the sensitivity of the Q_VD's dimensions on credit rating in both conventional and Islamic banks separately. Table 8 reports that the quantity dimension (Q_STR) has an insignificant association with credit ratings in both types of banks. However, the usefulness and spread dimensions show a positive and significant association with credit ratings in both types of banks. These outcomes are in line with the main findings presented in Table 7 and consistent with the argument that the quality of voluntary disclosure is more likely to be directly connected to the usefulness and spread of information rather than the quantity (level) of disclosed information (Beretta and Bozzolan, 2008; Salem et al., 2020). With respect to the audit quality, Big-4 and Co-audit are positively attributable to the bank's credit ratings,

whereas A-Opin has an insignificant association with credit ratings, which supports the main outcomes.

Table 9 examines the robustness of the association of audit quality with the credit ratings without including the voluntary disclosure quality (Q_VD) variable, which might have affected the main relationship. Remarkably, our findings confirm that audit quality proxies (Big-4 and Co-audit) have positive and significant associations with credit ratings in both conventional and Islamic banks. At the same time, audit opinion is negatively and significantly associated with credit ratings in conventional and Islamic banks. These findings support the main findings presented in Table 7 and are consistent with the theoretical argument that firms with high audit quality would be efficiently monitored by directors to ensure meeting their financial obligations (Grassa, 2015).

Insert Table 8

Insert Table 9

5.4 Additional analysis

Our study provides several additional analyses to investigate the robustness of our primary findings. Firstly, an alternative measure for credit ratings is used to determine the robustness of the main results of various credit rating measures. Following prior studies, we converted the credit rating into a numerical score using an ordinal scale that ranges from 22 for the highest-rated bank (AAA) to 1 for the poorest-rated bank (D) (Grassa et al., 2020; Gillette et al., 2020; He, G., 2018; Kisgen, D.J., 2019). Our findings, which are presented in Table 10, illustrate that both Q_VD and audit quality (Big-4 and Co-audit) are significantly linked with CR, suggesting that our primary outcomes are robust to alternative CR proxies. In addition, IAC and ACZ positively correlate with improving the credit ratings of conventional and Islamic banks.

Secondly, we investigate whether the effect of Q_VD on CR varies between banks with high Q_VD and low Q_VD to obtain confidence in our analysis that the main findings signify the association of Q_VD with CR. Therefore, we employed the

median value of Q_VD as a cut-off point to divide the sample into two sub-sets[7]. Table 11 reports that banks associated with high Q_VD, audited by Big-4 with additional auditing firms, are more likely to be associated with high credit ratings. In contrast, audit opinion seems to have a negative association with banks' credit ratings. On the other hand, banks with low Q_VD have an insignificant connection with CR. This finding could be attributed to the fact that large-sized banks are primarily associated with high Q_VD and face more robust monitoring mechanisms employed by regulators that assist directors in controlling their debt structure and default risk (Alali et al., 2012; Alissa et al., 2013).

Insert Table 10

Insert Table 11

5.5 Robustness tests

Besides the additional analysis, we re-estimated our model to examine the robustness of the main findings by using different samples of banks with similar incentives to enhance their credit ratings. We argue that banks with high profitability, high growth, and low leverage are more likely to pose a lower default risk and meet capital obligations, leading to a higher credit rating (Alissa et al., 2013). Also, we divided the sample into two subsamples to control the financial crisis (Elbannan and Elbannan, 2015; Salem et al.,2021). Therefore, we investigated a set of sub-samples, including bank years with high growth, high profitability, and low leverage before and after the financial crisis. The findings presented in Table 12 (Panel A and B) are like those revealed in the primary results and confirm that Q_VD and audit quality are positively correlated to banks' credit ratings.

Endogeneity concerns may arise due to possible reverse causality or unobservable heterogeneity between dependent and independent variables. Better credit ratings, for example, may cut the cost of bank borrowing, allowing more resources to be allocated to enhancing transparency and audit quality. In this respect, credit ratings depend on the quality of both disclosure and audit practices; therefore,

[7] Banks with a value below the median value are identified as low Q_VD banks and banks with a value equal or above the median value are considered as high Q_VD banks.

we may encounter the reverse causality problem between the outcome variable and predictors.

We apply three different procedures to address endogeneity problems. Firstly, following Harris et al. (2019), we add the lagged values of Q_VD to lessen the endogeneity and reassess our main outcomes. Table 13 (Panel A) reveals that the findings are in line with those reported in Table 7, signifying that the existence of the endogeneity issue does not influence our findings. Secondly, we controlled for the endogeneity issue by conducting 2SLS regression, following Abdelfattah and Aboud (2020) and Lin et al. (2017), where bank-type is employed as an instrumental variable. The employed instrument is considered valid since there is an insignificant correlation between the study variables and the error (AR1 Pr=0.165 and AR2 Pr=0.274). The findings reported in Table 13 (Panel B) are consistent with our primary results.

As a common endogeneity check technique, we adopted the GMM estimation method to address the potential endogeneity issue and weighted sample moment conditions following Issa et al. (2021). GMM method fits with a wide range of explanatory factors that are less likely to be strictly exogenous and linked to current realizations of inaccuracy (Arellano & Bond, 1991; Kim et al., 2014). Additionally, the GMM method maximizes estimation reliability by reducing issues caused by underpowered instruments and preventing proliferation (Dhaliwal et al., 2011). Further, to evaluate the accuracy of the dynamic GMM estimator, the Arellano-Bond test and the Hansen test are implemented. The results of these tests are insignificant, implying that our variables are exogenous and that the GMM model is a suitable estimator to address the possibility of endogeneity problems. The findings reported in Table 13 (Panel C) provide evidence that our main variables of interest are in line with the primary result.

Insert Table 12

Insert Table 13

6. Conclusion

Previous studies were limited to the impact of the extent (level) of voluntary disclosures on the credit rating of conventional banks, mainly in developed settings. Therefore, our study extends this work by evaluating the possible effect of voluntary disclosure

quality on Islamic and Conventional Banks' credit ratings in an under-researched context of emerging economies. Likewise, we add to the debate on whether audit quality as a proxy for disclosure quality can predict banks' credit ratings in emerging and transitional economies.

Using 1590 bank-year observations of 29 Islamic and 77 conventional banks across 17 MENA countries from 2006 to 2020, our findings suggest that voluntary disclosure quality is significantly and positively associated with improving the credit ratings of Islamic and conventional banks in the chosen emerging economies. Specifically, the spread and usefulness of disclosed information have positive and significant relationships with banks' ratings. In contrast, the quantity dimension of voluntary disclosure is insignificantly associated with banks' credit ratings. Additionally, audit quality is significantly attributed to Islamic banks' credit ratings compared with an insignificant nexus documented among their conventional counterparts.

Our empirical evidence has several implications for managers, lenders, policymakers, regulators, and banking authorities in emerging and transitional economies. For example, our evidence sheds light on the value and informativeness of corporate voluntary disclosures for rating agencies to assess Islamic and traditional banks' credit ratings in emerging economies. Therefore, our empirical results encourage bank managers to voluntarily disclose more useful voluntary information and ensure a high-quality audit to enhance their credit ratings. Our findings will empower bank managers to provide more helpful information that enables their customers and investors to make relevant financial decisions. Notably, our study reiterates the critical need for more effective regulatory reforms to enhance the quality of financial reporting (i.e., audit quality) in traditional banks to improve their credit ratings compared with their Islamic counterparts.

Hence, our findings contribute significantly to the accounting and finance literature on emerging economics. We urge the upcoming studies to contribute to this contemporary literature in other contexts by examining the influence of other possible contextual factors on the nexuses between credit ratings and audit quality. These findings are worth integrating into the accounting and financial curriculum to motivate the students to contribute more to the literature. Finally, our findings have empirically supported the theoretical importance of disclosure and audit quality in enhancing

banks' credit ratings. Therefore, the practical applications of our findings are clear as they provide a roadmap for bank managers and educators.

We also suggest that the regulators in these emerging economies utilize these findings to implement or revise corporate reporting reforms effectively. Transparent and high-quality disclosures promote investor trust in these economies, which leads to higher bank credit ratings, financial stability, and economic growth. Hence, the banks in these economies can offer various financial products and services for their customers, potentially enhancing the quality of life and well-being of society.

Although our findings are robust in terms of various variables' measures and endogeneity problems, the remaining limitations should be acknowledged. Firstly, similar to other archival empirical research papers, the measures utilized for voluntary disclosure quality, audit quality, and banks' credit ratings might or might not represent actual performance. Therefore, future studies may be able to provide additional insights by undertaking primary data techniques, such as in-depth case studies and interviews. Secondly, our sample is restricted to 106 banks across 17 emerging economies from 2006 to 2020. Future studies will benefit from examining the relationship between voluntary disclosure, audit quality, and bank credit rating in both developed and developing countries. This broader sample will help uncover the influence of the other possible contextual factors on the nexus between credit ratings and audit quality.

Expects Data Sharing: The authors confirm that all data underlying the findings and any other supporting information are available on request.

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Results

Table 1 Banks' Specialisation by Countries

No	Country	Number of IBs	Number of NIBs	Total number of banks
1	Bahrain	8	5	13
2	Egypt	1	4	5
3	Iraq	0	2	2
4	Iran	2	0	2
5	Israel	0	3	3
6	Jordan	2	10	12
7	Kuwait	4	4	8
8	Lebanon	0	2	2
9	Morocco	0	4	4
10	Oman	0	4	4
11	Qatar	1	5	6
12	Saudi Arabia	4	5	9
13	Syria	0	6	6
14	Tunisia	0	7	7
15	UEA	4	14	18
16	Palestine	2	2	4
17	Yemen	1	0	1
Total of observations over 15 years (2006-2020)		**435**	**1,155**	**1,590**

Table 2 Credit rating distribution by bank type

Credit Rating	Full sample	Conventional banks	Islamic Banks
AA+	6	6	-
AA	42	-	42
AA-	25	25	-
A+	155	55	100
A	104	68	36
A-	***161***	***82***	***79***
BBB+	468	415	53
BBB	26	17	9
BBB-	42	32	10
BB+	210	209	1
BB	15	11	4
BB-	258	172	86
B-	9	9	-
CC	13	13	-
C	14	14	-
D	3	3	-
WD/N/A	39	24	15
Total	1590	1155	435

Using **A-** as a cut-off point: (493 out of 1590), (236 out of 1155) and (257 out of 435) observations are highly ranked in the **Entire sample, Conventional and Islamic banks, respectively.**

Table 3 Credit rating distribution across years (Full sample, conventional, Islamic)

Panel A Full sample

CR	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
AA+	0	1	0	1	1	1	0	0	0	0	0	1	1	0	0	6
AA	5	4	3	2	2	2	2	2	3	4	5	4	4	0	0	42
AA-	0	1	2	2	2	2	2	2	2	3	2	1	2	1	1	25
A+	7	7	10	10	12	12	15	15	14	14	11	7	7	7	7	155
A	12	13	5	5	5	5	4	4	7	5	7	8	8	8	8	104
A-	***14***	***12***	***18***	***10***	***10***	***10***	***11***	***12***	***10***	***9***	***11***	***7***	***7***	***10***	***10***	***161***
BBB+	6	11	7	9	40	36	36	38	31	31	33	36	49	52	53	468
BBB	5	0	0	1	5	2	2	3	3	3	2	0	0	0	0	26
BBB-	1	1	1	0	0	1	2	4	5	5	6	6	6	0	4	42
BB+	40	40	40	40	2	2	6	2	2	2	4	6	4	10	10	210
BB	1	2	0	2	1	2	0	1	1	1	1	0	1	1	1	15
BB-	11	10	13	17	20	25	20	17	22	23	18	26	13	14	9	258
B-	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	9
CC	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	13
C	0	0	1	2	1	1	1	1	1	1	1	1	1	1	1	14
D	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3
WD/N/A	2	2	4	4	4	4	3	3	3	3	3	1	1	1	1	39
Total	**106**	**106**	**106**	**106**	**106**	**106**	**106**	**106**	**106**	**106**	**106**	**106**	**106**	**106**	**106**	**1590**

Panel B Conventional banks

CR	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
AA+	0	1	0	1	1	1	0	0	0	0	0	1	1	0	0	6
AA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
AA-	0	1	2	2	2	2	2	2	2	3	3	2	2	0	0	25
A+	3	2	4	3	3	4	6	6	6	6	6	3	1	1	1	55
A	6	7	5	5	5	4	4	4	6	4	4	7	4	2	1	68
A-	***8***	***6***	***9***	***8***	***9***	***8***	***8***	***8***	***5***	***4***	***5***	***2***	***1***	***0***	***1***	***82***
BBB+	4	8	5	6	36	33	32	34	34	30	28	31	42	57	59	439
BBB	4	0	0	0	3	2	1	2	2	2	1	0	0	0	0	17
BBB-	0	0	0	0	0	1	2	3	4	6	6	5	3	1	1	32
BB+	39	40	35	33	2	2	5	2	2	2	4	6	2	1	1	176
BB	1	1	0	1	0	3	0	1	1	1	1	0	1	0	0	11
BB-	1	1	2	1	1	1	1	1	1	1	1	2	2	1	1	18
B-	6	5	10	12	11	12	12	10	10	14	14	15	15	14	12	172
CC	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	13
C	1	1	1	2	1	1	1	1	1	1	1	1	1	0	0	14
D	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3
WD/N/A	2	2	2	2	2	2	2	2	2	2	2	1	1	0	0	24
Total	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**1,155**

Panel C Islamic banks

CR	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
AA+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AA	5	4	3	2	2	2	2	2	3	4	5	4	4	0	0	42
AA-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A+	4	5	9	9	9	9	10	9	8	9	7	6	6	0	0	100
A	6	6	1	1	1	2	3	3	3	1	3	3	3	0	0	36
A-	***6***	***6***	***9***	***8***	***7***	***7***	***6***	***4***	***5***	***5***	***6***	***5***	***5***	0	0	***79***
BBB+	2	3	2	3	3	4	3	6	5	5	3	7	7	0	0	53
BBB	1	0	0	1	2	0	1	1	1	1	1	0	0	0	0	9
BBB-	1	1	1	0	0	0	0	1	1	1	1	2	1	0	0	10
BB+	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
BB	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	4
BB-	3	2	2	2	2	2	2	2	2	2	2	2	3	29	29	86
B-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WD/N/A	1	1	2	2	2	2	1	1	1	1	1	0	0	0	0	15
Total	**29**	**29**	**29**	**29**	**29**	**29**	**29**	**29**	**29**	**29**	**29**	**29**	**29**	**29**	**29**	**435**

Table 4 Descriptive statistics

	Conventional banks								Islamic banks							
variables	**Mean**	**Median**	**S.D**	**p25**	**p75**	**p95**	**Min**	**Max**	**Mean**	**Median**	**S.D**	**p25**	**p75**	**p95**	**Min**	**Max**
CR1	0.2597	0	0.4387	0	1	1	0	1	0.6605	1	0.4742	0	1	1	0	1
CR2	3.8462	4	1.1092	3	4	5	0	6	4.4854	5	1.2379	4	5	6	0	6
Q_VD	0.6189	0.6317	0.0845	0.5934	0.6684	0.7367	0.2645	0.7686	0.5911	0.6172	0.0930	0.5570	0.6542	0.7042	0.2927	0.7434
Big4	0.5485	1	0.4979	0	1	1	0	1	0.7294	1	0.4448	0	1	1	0	1
Co-audit	0.3656	0	0.4818	0	1	1	0	1	0.5729	1	0.4953	0	1	1	0	1
A-Opin	0.0470	0	0.2116	0	0	0	0	1	0.0492	0	0.1685	0	0	0	0	1
IAC	0.3939	0.5	0.3829	0	0.6667	1	0	1	0.8412	1	0.3356	1	1	1	0	1
ACZ	3.1518	3	1.1068	2	4	6	2	6	3.1194	3	0.8957	3	3	5	0	5
ACM	4.6553	4	1.2744	4	5	7	3	11	4.7878	5	1.0067	4	5	7	2	9
Bank-s	7.7905	3.4405	9.1451	2.5222	10.7540	27.9191	0.0014	52.3334	13.5183	12.2842	11.1087	2.9883	23.4525	32.4230	0.0003	39.7666
Growth	0.1688	0.1304	0.1540	0.0958	0.1658	0.5604	0.0001	0.9504	0.2103	0.1434	0.2039	0.1028	0.2217	0.8143	0.0007	0.9275
LEVER	0.7925	0.8676	0.2249	0.8209	0.9023	0.9403	0	0.9941	0.7602	0.8654	0.2496	0.7523	0.9057	0.9606	-0.4180	0.9904
PROFIT	0.6038	0.5901	0.4679	0.1606	0.9473	1.3385	-0.0032	2.2988	0.0462	0.0165	0.1301	0.0086	0.0320	0.2377	-0.4435	0.7952
LIQ	2.2850	1.1600	5.4884	1.1083	1.3471	4.4506	0	51.1224	3.2276	1.1631	10.1503	1.1028	1.3807	11.5140	-2.3924	87.5590
CAP	0.1619	0.1342	0.1609	0.0977	0.1755	0.3204	7.13E-05	2.3688	0.1758	0.1348	0.1586	0.0995	0.1879	0.4353	0.0294	1.4180
PT	0.2478	0	0.4319	0	0	1	0	1	0.0690	0	0.2537	0	0	1	0	1

CR1= measured as a dummy variable encoded 1 if the bank is rated between AAA to A- levels and 0 otherwise. ***CR2***= measured by using a score between 1 for the lowest-rated bank to 7 for the highest-rated bank. ***Q_VD*=** stands for the quality of voluntary disclosure, ***Big4*=** is a dummy variable the takes the value of one if the largest four auditing firms audit the bank and zero otherwise, ***Co-audit*=** A dummy variable that takes 1 if a bank is audited by two audit firms and 0 otherwise, ***A-Opin*=** a dummy variable that takes 1 if auditor issued a going-concern opinion, and 0 otherwise, ***IAC*=** is measured as the number of independent directors on the audit committee scaled by the total number of audit committee members, ***ACZ*=** represents the size of the audit committee, ***ACM*=** stands for the total number of audit committee meeting held in a financial year, ***Bank-s*=** is measured as a natural logarithm of total assets, ***Growth*=** is calculated as the change in total assets scaled by the lag of total assets, ***LEVER*=** is measured as total liabilities divided by total assets, ***PROFIT*=** is calculated as net income scaled by the lag of total assets, ***LIQ*=** is measured as current assets scaled by current liabilities, ***CAP*=** represents capital adequacy ratio and is measured as the proportion of actual regulatory capital (Tier 1 capital) divided by the total assets, ***PT*=** is a dummy variable that takes the value of one if a bank is based in Egypt, Yemen, Syria, Tunisia, or Iraq and zero otherwise.

Table 5 Comparison tests of the credit rating Q_VD and Audit Quality

	Mean		Median			
Variables	**Conventional Banks**	**Islamic Banks**	**Conventional Banks**	**Islamic Banks**	**T-Test**	**Wilcoxon Signed-Ranks**
CR1	0.2597	0.6604	0	1	0.001***	0.001***
CR2	3.8461	4.4854	4	5	0.001***	0.001***
Q_VD	0.6189	0.5911	0.6317	0.6172	0.001***	0.001***
Big4	0.5484	0.7294	1	1	0.001***	0.001***
Co-audit	0.3656	0.5729	0	1	0.001***	0.001***
A-Opin	0.0469	0.0491	0	0	0.1431	0.1441
IAC	0.3938	0.8412	0.5	1	0.001***	0.001***
ACZ	3.1518	3.1193	3	3	0.6090	0.009***
ACM	4.6553	4.7877	4	5	0.069*	0.001***
Bank-s	-	-	-	-	-	-
Growth	-	-	-	-	-	-
LEVER	-	-	-	-	-	-
PROFIT	-	-	-	-	-	-
LIQ	-	-	-	-	-	-
CAP	-	-	-	-	-	-
PT	-	-	-	-	-	-

CR1= measured as a dummy variable encoded 1 if the bank is rated between AAA to A- levels and 0 otherwise. ***CR2***= measured by using a score between 1 for the lowest-rated bank to 7 for the highest-rated bank. ***Q_VD*=** stands for the quality of voluntary disclosure, ***Big4*=** is a dummy variable the takes the value of one if the largest four auditing firms audit the bank and zero otherwise, ***Co-audit*=** A dummy variable that takes 1 if a bank is audited by two audit firms and 0 otherwise, ***A-Opin*=** a dummy variable that takes 1 if auditor issued a going-concern opinion, and 0 otherwise, ***IAC*=** is measured as the number of independent directors on the audit committee scaled by the total number of audit committee members, ***ACZ*=** represents the size of the audit committee, ***ACM*=** stands for the total number of audit committee meeting held in a financial year, ***Bank-s*=** is measured as a natural logarithm of total assets, ***Growth*=** is calculated as the change in total assets scaled by the lag of total assets, ***LEVER*=** is measured as total liabilities divided by total assets, ***PROFIT*=** is calculated as net income scaled by the lag of total assets, ***LIQ*=** is measured as current assets scaled by current liabilities, ***CAP*=** represents capital adequacy ratio and is measured as the proportion of actual regulatory capital (Tier 1 capital) divided by the total assets, ***PT*=** is a dummy variable that takes the value of one if a bank is based in Egypt, Yemen, Syria, Tunisia, or Iraq and zero otherwise.

Table 6 Correlation matrix analysis for conventional and Islamic banks

Panel A (Conventional Banks)

	Q_VD	Big4	RESERV	IAC	ACZ	ACM	ACG	Banks	Growth	LEVER	PROFIT	LIQ	CAP	PT
Q_VD	1.0000													
	0.2697													
Big4	0.0349	1.0000												
	0.2697													
Co-audit	0.0538	0.643	1.0000											
	0.0888	0.001***												
IAC	-0.1132	0.0646	-0.0617	1.0000										
	0.0003***	0.041	0.0509											
ACZ	0.0054	0.1863	0.042	0.3665	1.0000									
	0.8634	0.001***	0.1838	0.001***										
ACM	0.026	0.2115	0.0931	0.3341	0.4143	1.0000								
	0.4116	0.001***	0.0032	0.001***	0.001***									
A-Opin	-0.0159	0.154	-0.0214	0.1765	0.3196	0.149	1.0000							
	0.6164	0.001***	0.4984	0.001***	0.001***	0.001***								
Bank-s	0.1039	0.2546	0.1562	0.1595	0.2241	0.2964	0.1977	1.0000						
	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***							
Growth	0.1933	0.3485	0.3241	0.0301	0.0815	0.1924	0.0781	0.3289	1.0000					
	0.001***	0.001***	0.001***	0.3417	0.009***	0.001***	0.01***	0.001***						
LEVER	-0.2116	-0.1984	-0.1971	0.0009	-0.0692	-0.0881	-0.0277	-0.2452	-0.6973	1.0000				
	0.001***	0.001***	0.001***	0.9767	0.0285	0.005***	0.3805	0.001***	0.001***					
PROFIT	-0.1523	-0.1406	-0.1657	0.0901	0.0043	0.0031	-0.033	0.0999	0.0269	0.0237	1.0000			
	0.001***	0.001***	0.001***	0.004***	0.8915	0.9232	0.2972	0.001***	0.3957	0.4531				
LIQ	0.2751	0.1869	0.1777	-0.0082	0.0286	0.0855	0.0342	0.1904	0.6236	-0.5968	-0.0294	1.0000		
	0.001***	0.001***	0.001***	0.7967	0.3661	0.006***	0.279	0.001***	0.001***	0.001***	0.3533			
CAP	0.0557	0.2065	0.2552	-0.0194	-0.0118	0.0405	0.0722	0.0593	0.2017	-0.1034	-0.0441	0.0884	1.0000	
	0.0781	0.001***	0.001***	0.5403	0.7100	0.1999	0.0224	0.0606	0.001***	0.001***	0.1637	0.005***		
PT	-0.0333	-0.4372	-0.4309	-0.0386	-0.1645	-0.2153	-0.1274	-0.3304	-0.1395	0.0925	0.0138	-0.078	-0.0703	1.0000
	0.2923	0.001***	0.001***	0.2227	0.001***	0.001***	0.001***	0.001***	0.001***	0.003***	0.6633	0.003***	0.0262	

CR1= measured as a dummy variable encoded 1 if the bank is rated between AAA to A- levels and 0 otherwise. ***CR2***= measured by using a score between 1 for the lowest-rated bank to 7 for the highest-rated bank. ***Q_VD*=** stands for the quality of voluntary disclosure, ***Big4*=** is a dummy variable the takes the value of one if the largest four auditing firms audit the bank and zero otherwise, ***Co-audit*=** A dummy variable that takes 1 if a bank is audited by two audit firms and 0 otherwise, ***A-Opin*=** a dummy variable that takes 1 if auditor issued a going-concern opinion, and 0 otherwise, ***IAC*=** is measured as the number of independent directors on the audit committee scaled by the total number of audit committee members, ***ACZ*=** represents the size of the audit committee, ***ACM*=** stands for the total number of audit committee meeting held in a financial year, ***Bank-s*=** is measured as a natural logarithm of total assets, ***Growth*=** is calculated as the change in total assets scaled by the lag of total assets, ***LEVER*=** is measured as total liabilities divided by total assets, ***PROFIT*=** is calculated as net income scaled by the lag of total assets, ***LIQ*=** is measured as current assets scaled by current liabilities, ***CAP*=** represents capital adequacy ratio and is measured as the proportion of actual regulatory capital (Tier 1 capital) divided by the total assets, ***PT*=** is a dummy variable that takes the value of one if a bank is based in Egypt, Yemen, Syria, Tunisia, or Iraq and zero otherwise.

Panel B (Islamic Banks)

	Q_VD	Big4	RESERV	IAC	ACZ	ACM	ACG	Banks	Growth	LEVER	PROFIT	LIQ	CAP	PT
Q_VD	1.0000													
Big4	0.1096	1.0000												
	0.0333													
Co-audit	0.0187	0.3554	1.0000											
	0.7176	0.001***												
IAC	0.006	0.1792	0.0273	1.0000										
	0.9078	0.005***	0.5969											
ACZ	0.0347	0.2815	0.0167	0.3697	1.0000									
	0.5019	0.001***	0.7468	0.001***										
ACM	0.0148	0.0674	0.0969	0.1408	0.3084	1.0000								
	0.7743	0.1913	0.0602	0.006***	0.001***									
A-Opin	0.0682	0.1056	0.1497	0.0821	0.1707	0.0731	1.0000							
	0.1862	0.0405	0.003***	0.1114	0.009***	0.1564								
Bank-s	0.0778	0.3952	0.3909	0.0231	0.2528	0.1272	0.1813	1.0000						
	0.1314	0.001***	0.001***	0.6544	0.001***	0.0135	0.004***							
Growth	0.0217	0.133	0.0218	0.0349	0.2859	0.1826	0.1243	0.269	1.0000					
	0.6745	0.009***	0.6733	0.4989	0.001***	0.004***	0.0157	0.001***						
LEVER	0.0628	0.1529	0.0172	0.0868	0.2264	0.3092	0.0268	0.1744	0.4376	1.0000				
	0.2235	0.002***	0.7397	0.0922	0.001***	0.001***	0.6038	0.007***	0.001***					
PROFIT	0.008	0.1148	0.056	0.1172	0.0309	0.0029	0.0033	0.1121	0.1242	0.2692	1.0000			
	0.8776	0.0258	0.2784	0.0228	0.5496	0.9556	0.9495	0.0295	0.0158	0.001***				
LIQ	0.0274	0.123	0.0608	0.0714	0.1963	0.2533	0.0371	0.1473	0.2706	0.4532	0.0233	1.0000		
	0.5965	0.0169	0.2391	0.1663	0.001***	0.001***	0.4724	0.004***	0.001***	0.001***	0.6523			
CAP	0.1466	0.2373	0.1896	0.1185	0.0727	0.0026	0.024	0.1226	0.0637	0.0602	0.015	0.1425	1.0000	
	0.0043	0.001***	0.002***	0.0213	0.1586	0.9599	0.6422	0.0173	0.2173	0.2434	0.7723	0.005***		
PT	0.077	0.2348	0.3152	0.0585	0.0129	0.1928	0.0472	0.1783	0.0438	0.136	0.0759	0.0428	0.0646	1.0000
	0.1355	0.001***	0.001***	0.2573	0.8027	0.002***	0.3609	0.005***	0.3963	0.008***	0.1412	0.4072	0.2106	1.000

CR1= measured as a dummy variable encoded 1 if the bank is rated between AAA to A- levels and 0 otherwise. ***CR2***= measured by using a score between 1 for the lowest-rated bank to 7 for the highest-rated bank. ***Q_VD*=** stands for the quality of voluntary disclosure, ***Big4*=** is a dummy variable the takes the value of one if the largest four auditing firms audit the bank and zero otherwise, ***Co-audit*=** A dummy variable that takes 1 if a bank is audited by two audit firms and 0 otherwise, ***A-Opin*=** a dummy variable that takes 1 if auditor issued a going-concern opinion, and 0 otherwise, ***IAC*=** is measured as the number of independent directors on the audit committee scaled by the total number of audit committee members, ***ACZ*=** represents the size of the audit committee, ***ACM*=** stands for the total number of audit committee meeting held in a financial year, ***Bank-s*=** is measured as a natural logarithm of total assets, ***Growth*=** is calculated as the change in total assets scaled by the lag of total assets, ***LEVER*=** is measured as total liabilities divided by total assets, ***PROFIT*=** is calculated as net income scaled by the lag of total assets, ***LIQ*=** is measured as current assets scaled by current liabilities, ***CAP*=** represents capital adequacy ratio and is measured as the proportion of actual regulatory capital (Tier 1 capital) divided by the total assets, ***PT*=** is a dummy variable that takes the value of one if a bank is based in Egypt, Yemen, Syria, Tunisia, or Iraq and zero otherwise.

Table 7 Regression result for the relationship between CR, Q_VD and AQ

	Full sample				Conventional banks				Islamic banks			
Variables	**CR1**		**CR2**		**CR1**		**CR2**		**CR1**		**CR2**	
	Coef.	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**
Q_VD	0.5017	4.99***	0.8763	7.38***	0.3450	3.17***	1.5539	5.17***	0.5552	2.69***	2.1082	4.51***
Big4	0.1704	7.13***	0.2410	3.99***	0.1583	5.66***	0.0563	1.73*	0.1956	4.31***	0.5746	5.6***
Co-audit	0.1354	2.91***	0.5077	4.27***	0.1466	2.67***	0.6424	4.27***	0.0577	0.71	0.4230	2.21**
A-Opin	0.0173	0.28	-0.1241	-0.79	-0.1425	-1.47	-0.2751	-1.63	-0.6412	-1.16	-0.6272	-1.32
IAC	0.0472	1.69*	0.1560	2.20**	0.0578	1.95**	0.3084	3.78***	0.1042	1.7*	0.3178	2.28**
ACZ	0.0195	1.82**	0.1157	4.25***	0.0250	2.21**	0.1386	4.45***	0.0162	0.67	0.0555	1.01
ACM	0.0230	2.36***	0.0309	1.25	0.0544	5.27***	0.0491	1.72*	0.0425	1.98**	-0.0344	-0.71
Bank-s	-0.0047	-3.47***	0.0011	0.34	-0.0062	-3.74***	0.0009	0.19	-0.0024	-0.99	0.0010	0.18
Growth	-0.0314	-0.47	0.0097	0.06	-0.0720	-0.81	0.0814	0.33	-0.1243	-1.11	-0.0456	-0.18
LEVER	-0.0778	-1.56	-0.0499	-0.40	-0.0431	-0.74	0.0220	0.14	0.0772	0.76	0.0921	0.4
PROFIT	-0.0202	-0.74	0.0711	1.03	0.0121	0.48	0.0745	1.08	0.0202	0.14	-0.3222	-0.96
LIQ	0.0066	5.32***	-0.0003	-0.11	0.0174	9.45***	0.0127	2.5***	0.0017	0.93	-0.0067	-1.6
CAP	0.0076	0.12	-0.0681	-0.41	0.0350	0.57	-0.0248	-0.15	0.0838	0.4	-0.2341	-0.48
PT	-0.1316	-1.83**	-0.1319	-0.62	-0.1269	-1.52	0.0287	0.13	-0.0527	-0.25	-1.3805	-2.59***
Bank-type	0.3822	5.04***	0.4788	2.40***	-	-	-	-	-	-	-	-
_cons	-0.2368	-2.36***	0.8328	7.13***	-0.3234	-3.05***	1.7293	5.93***	0.3599	2.71***	2.9176	6.07***
	R-sq= 0.2905 Prob>chi2= 0.0001		R-sq= 0.1528 Prob>chi2= 0.0001		R-sq= 0.2638 Prob>chi2= 0.0001		R-sq= 0.1778 Prob>chi2= 0.0001		R-sq= 0.1480 Prob>chi2= 0.0001		R-sq= 0.4063 Prob>chi2= 0.0001	

CR1= measured as a dummy variable encoded 1 if the bank is rated between AAA to A- levels and 0 otherwise. ***CR2***= measured by using a score between 1 for the lowest-rated bank to 7 for the highest-rated bank. ***Q_VD=*** stands for the quality of voluntary disclosure, ***Big4=*** is a dummy variable the takes the value of one if the largest four auditing firms audit the bank and zero otherwise, ***Co-audit=*** A dummy variable that takes 1 if a bank is audited by two audit firms and 0 otherwise, ***A-Opin=*** a dummy variable that takes 1 if auditor issued a going-concern opinion, and 0 otherwise, ***IAC=*** is measured as the number of independent directors on the audit committee scaled by the total number of audit committee members, ***ACZ=*** represents the size of the audit committee, ***ACM=*** stands for the total number of audit committee meeting held in a financial year, ***Bank-s=*** is measured as a natural logarithm of total assets, ***Growth=*** is calculated as the change in total assets scaled by the lag of total assets, ***LEVER=*** is measured as total liabilities divided by total assets, ***PROFIT=*** is calculated as net income scaled by the lag of total assets, ***LIQ=*** is measured as current assets scaled by current liabilities, ***CAP=*** represents capital adequacy ratio and is measured as the proportion of actual regulatory capital (Tier 1 capital) divided by the total assets, ***PT=*** is a dummy variable that takes the value of one if a bank is based in Egypt, Yemen, Syria, Tunisia, or Iraq and zero otherwise. ***Bank-type***= is a dummy variable that assigns 1 to Islamic banks and 0 to conventional banks.

Table 8 Results of the relationship between CR and three dimensions of Q_VD

	Full sample				Conventional banks				Islamic banks			
Variables	**CR1**		**CR2**		**CR1**		**CR2**		**CR1**		**CR2**	
	Coef.	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**
Q_STR	0.0331	0.60	0.0437	0.31	0.0859	1.18	0.1074	0.53	0.0018	0.02	0.1920	0.87
Spread	0. 3126	2.33***	0.5524	4.50***	0.8119	5.51***	0.3975	3.42***	0.7374	2.02**	0.6398	2.73***
Usefulness	0.1131	6.83***	0.1618	3.81***	0.0185	1.8*	0.2419	3.78***	0.1782	6.96***	0.0728	2.17**
Big4	0.1572	6.66***	0.2164	3.57***	0.1540	5.63***	0.1394	1.72*	0.2006	4.42***	0.5904	5.52***
Co-audit	0.1461	3.25***	0.5302	4.46***	0.1252	2.3**	0.6525	4.34***	0.0667	0.94	0.4849	2.44***
A-Opin	0.0278	0.46	-0.0515	-0.33	-0.1106	-1.26	-0.1821	-1.16	0.2663	1.42	0.6901	1.33
IAC	0.0889	3.19***	0.0491	0.69	0.0971	3.32***	0.1841	2.27**	0.1250	2.06**	0.3714	2.56***
ACZ	0.0142	1.53	0.1040	3.81***	0.0154	1.38	0.1095	3.55***	0.0266	1.14	0.0609	1.08
ACM	0.0151	1.56	0.0055	0.22	0.0477	4.7***	0.0321	1.14	-0.0316	-1.47	-0.0682	-1.31
Bank-s	-0.0054	-4.00***	-0.0005	-0.14	-0.0056	-3.4***	0.0016	0.34	-0.0031	-1.36	-0.0022	-0.4
Growth	-0.0125	-0.19	0.0497	0.29	-0.1738	-1.47	-0.1471	-0.6	-0.0803	-0.74	0.1366	0.52
LEVER	-0.1013	-2.06**	-0.1303	-1.03	-0.1150	-1.96**	-0.1642	-1.01	0.1039	1.07	0.0337	0.14
PROFIT	0.0321	1.19	0.0964	1.39	0.0240	0.97	0.1090	1.59	0.1016	0.7	-0.3627	-1.04
LIQ	0.0054	4.41***	-0.0019	-0.61	0.0169	9.02***	0.0114	2.21**	-0.0001	-0.07	0.0073	1.7*
CAP	0.0062	0.10	-0.0930	-0.56	0.0211	0.35	-0.0226	-0.13	0.1135	0.6	-0.4049	-0.8
PT	-0.1423	-1.19	-0.0186	-0.09	-0.0853	-1.03	0.1911	0.84	-0.1046	-0.63	-1.2830	-2.23**
Bank-type	0.3375	4.74***	0.3156	1.69*	-	-	-	-	-	-	-	-
_cons	-0.3528	-3.68***	0.8662	7.44***	-0.4951	-5.04***	0.5189	5.6***	0.4966	2.99***	3.6757	6.04***
	R-sq= 0.4021		R-sq= 0.1769		R-sq= 0.2993		R-sq= 0.2113		R-sq= 0.6274		R-sq= 0.4073	
	Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001	

Q_STR= standardised relative quantity index for the bank *i* at year *t*. ***Spread*=** the average of the dispersion and the coverage of the information revealed by bank *i* at year *t,* ***Usefulness*=** based on the IFRS qualitative criteria, the degree of information revealed by bank *i* at year *t,* ***Big4*=** is a dummy variable the takes the value of one if the largest four auditing firms audit the bank and zero otherwise, ***Co-audit*=** A dummy variable that takes 1 if a bank is audited by two audit firms and 0 otherwise, ***A-Opin*=** a dummy variable that takes 1 if auditor issued a going-concern opinion, and 0 otherwise, ***IAC*=** is measured as the number of independent directors on the audit committee scaled by the total number of audit committee members, ***ACZ*=** represents the size of the audit committee, ***ACM*=** stands for the total number of audit committee meeting held in a financial year, ***Bank-s*=** is measured as a natural logarithm of total assets, ***Growth*=** is calculated as the change in total assets scaled by the lag of total assets, ***LEVER*=** is measured as total liabilities divided by total assets, ***PROFIT*=** is calculated as net income scaled by the lag of total assets, ***LIQ*=** is measured as current assets scaled by current liabilities, ***CAP*=** represents capital adequacy ratio and is measured as the proportion of actual regulatory capital (Tier 1 capital) divided by the total assets, ***PT*=** is a dummy variable that takes the value of one if a bank is based in Egypt, Yemen, Syria, Tunisia, or Iraq and zero otherwise. ***Bank-type***= is a dummy variable that assigns 1 to Islamic banks and 0 to conventional banks.

Table 9 Results of the relationship between CR and AQ without Q_VD variable (Full sample, conventional and Islamic banks)

	Full sample				Conventional banks				Islamic banks			
Variables	**CR1**		**CR2**		**CR1**		**CR2**		**CR1**		**CR2**	
	Coef.	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**
Big4	0.1758	7.42***	0.2721	4.42***	0.1631	5.81***	0.2788	3.01***	0.2097	4.62***	0.6272	6.02***
Co-audit	0.1483	3.18***	0.5530	4.59***	0.1538	2.8***	0.6669	4.4***	0.0777	2.95***	0.5106	2.58***
A-Opin	-0.0198	-0.32	-0.1130	-0.71	-0.1426	-2.46***	-0.2758	-1.71**	-0.6565	-3.19***	-0.6663	-1.66*
IAC	-0.0517	-1.83*	0.1383	1.91**	0.0620	2.09**	0.2883	3.49***	0.1100	1.78*	0.3367	2.37**
ACZ	0.0210	1.93*	0.1211	4.36***	0.0256	2.26**	0.1414	4.48***	0.0175	0.72	0.0597	1.06
ACM	0.0234	2.38***	0.0312	1.24	0.0563	5.44***	0.0570	1.98**	0.0481	2.24**	0.0544	1.10
Bank-s	-0.0052	-3.79***	-0.0005	-0.15	-0.0063	-3.79***	0.0004	0.08	-0.0031	-1.29	-0.0018	-0.33
Growth	0.0057	0.08	0.1060	0.61	-0.0652	-0.73	0.1123	0.45	-0.0903	-0.8	0.0868	0.33
LEVER	-0.0826	-1.64	-0.0680	-0.53	-0.0421	-0.72	0.0259	0.16	0.0569	0.56	0.0136	0.06
PROFIT	-0.0189	-0.69	0.0682	0.97	0.0119	0.47	0.0741	1.06	-0.0013	-0.01	-0.4096	-1.19
LIQ	0.0069	5.57***	0.0010	0.32	0.0182	9.91***	0.0162	3.17***	0.0018	0.94	-0.0066	-1.54
CAP	0.0125	0.19	-0.0516	-0.30	0.0388	0.63	-0.0078	-0.05	0.0611	0.29	-0.3120	-0.62
PT	-0.1235	-1.81*	-0.1058	-0.50	-0.1221	-1.47	0.0457	0.20	-0.0180	-0.08	-1.2433	-2.17**
Bank-type	0.3678	4.84***	0.4266	2.15**	-	-	-	-	-	-	-	-
_cons	0.1062	1.74*	2.9498	13.97***	-0.1288	-1.48	2.6132	10.91	0.7145	4.29	4.2507	10.85
	R-sq= 0.3435		R-sq= 0.1625		R-sq= 0.2552		R-sq= 0.1524		R-sq= 0.1172		R-sq= 0.3741	
	Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001	

CR1= measured as a dummy variable encoded 1 if the bank is rated between AAA to A- levels and 0 otherwise. ***CR2***= measured by using a score between 1 for the lowest-rated bank to 7 for the highest-rated bank. ***Big4=*** is a dummy variable the takes the value of one if the largest four auditing firms audit the bank and zero otherwise, ***Co-audit=*** A dummy variable that takes 1 if a bank is audited by two audit firms and 0 otherwise, ***A-Opin=*** a dummy variable that takes 1 if auditor issued a going-concern opinion, and 0 otherwise, ***IAC=*** is measured as the number of independent directors on the audit committee scaled by the total number of audit committee members, ***ACZ=*** represents the size of the audit committee, ***ACM=*** stands for the total number of audit committee meeting held in a financial year, ***Bank-s=*** is measured as a natural logarithm of total assets, ***Growth=*** is calculated as the change in total assets scaled by the lag of total assets, ***LEVER=*** is measured as total liabilities divided by total assets, ***PROFIT=*** is calculated as net income scaled by the lag of total assets, ***LIQ=*** is measured as current assets scaled by current liabilities, ***CAP=*** represents capital adequacy ratio and is measured as the proportion of actual regulatory capital (Tier 1 capital) divided by the total assets, ***PT=*** is a dummy variable that takes the value of one if a bank is based in Egypt, Yemen, Syria, Tunisia, or Iraq and zero otherwise. ***Bank-type***= is a dummy variable that assigns 1 to Islamic banks and 0 to conventional banks.

Table 10 Additional analysis (using alternative measurement of CR).

	Full sample		Conventional banks		Islamic banks	
Variables	**CR3**		**CR3**		**CR3**	
	Coef.	**Z**	**Coef.**	**Z**	**Coef.**	**Z**
Q_VD	8.0693	9.25***	6.4049	6.54***	9.2361	5.42***
Big4	0.9177	4.42***	0.1917	1.76**	2.0763	5.54***
Co-audit	1.4376	3.50***	1.8275	3.65***	1.4623	2.11**
A-Opin	-0.1345	-0.25	-0.4756	-0.91	-0.0523	-0.03
IAC	0.5096	2.10***	1.0176	3.82***	1.1356	2.24**
ACZ	0.2971	3.18***	0.3251	3.19***	0.3046	1.52
ACM	0.0757	0.89	0.1443	1.55	-0.0684	-0.39
Bank-s	0.0109	0.92	0.0187	1.24	0.0033	0.17
Growth	0.3453	0.59	0.3867	0.48	-0.4116	-0.44
LEVER	-0.4030	-0.93	0.4308	0.82	-0.1000	-0.12
PROFIT	-0.0617	0.26	0.0247	0.11	-0.8215	-0.67
LIQ	0.0031	0.29	0.0934	5.63***	0.0458	3.01***
CAP	-0.1055	-0.18	-0.0722	-0.13	-0.0926	-0.05
PT	-0.1258	-0.17	0.4257	0.55	-4.5631	-2.39**
Bank-type	0.8717	1.25	-	-	-	-
_cons	6.6610	7.53***	6.3101	6.56***	8.5754	4.9
	R-sq= 0.1617		R-sq= 0.2263		R-sq= 0.4327	
	Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001	

CR3= the credit rating converted into a numerical score by means of an ordinal scale that ranges from 22 for the highest-rated bank (AAA) to 1 for the poorest-rated bank (D), ***Q_VD=*** stands for the quality of voluntary disclosure, ***Big4=*** is a dummy variable the takes the value of one if the largest four auditing firms audit the bank and zero otherwise, ***Co-audit=*** A dummy variable that takes 1 if a bank is audited by two audit firms and 0 otherwise, ***A-Opin=*** a dummy variable that takes 1 if auditor issued a going-concern opinion, and 0 otherwise, ***IAC=*** is measured as the number of independent directors on the audit committee scaled by the total number of audit committee members, ***ACZ=*** represents the size of the audit committee, ***ACM=*** stands for the total number of audit committee meeting held in a financial year, ***Bank-s=*** is measured as a natural logarithm of total assets, ***Growth=*** is calculated as the change in total assets scaled by the lag of total assets, ***LEVER=*** is measured as total liabilities divided by total assets, ***PROFIT=*** is calculated as net income scaled by the lag of total assets, ***LIQ=*** is measured as current assets scaled by current liabilities, ***CAP=*** represents capital adequacy ratio and is measured as the proportion of actual regulatory capital (Tier 1 capital) divided by the total assets, ***PT=*** is a dummy variable that takes the value of one if a bank is based in Egypt, Yemen, Syria, Tunisia, or Iraq and zero otherwise. ***Bank-type***= is a dummy variable that assigns 1 to Islamic banks and 0 to conventional banks.

Table 11 Results of the relationship between CR and high/ low Q_VD

	Full sample - *L- Q_VD*				Full sample - *H-Q_VD*			
Variables	**CR1**		**CR2**		**CR1**		**CR2**	
	Coef.	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**
Q_VD	0.1927	1.61	0.1286	1.35	1.5749	4.90***	1.8564	2.37**
Big4	0.1763	1.30	0.1490	1.63	0.1184	3.53***	0.3696	2.85***
Co-audit	0.1389	1.25	0.1359	1.17	0. 1511	2.70***	0.4680	3.36***
A-Opin	-0.1401	-1.68	-0.1225	1.28	-0.3774	-3.85***	-0.5042	-2.09**
IAC	0.0773	0.87	0.0568	0.51	0.0068	0.19	0.2291	2.56***
ACZ	0.0320	2.09**	0.0978	2.37**	0.0015	0.10	0.1119	3.05***
ACM	0.0321	2.18**	0.0354	0.89	0.0193	1.56	0.0383	1.26
Bank-s	-0.0030	-1.58	0.0052	0.99	-0.0022	-1.28	0.0026	0.60
Growth	0.1834	1.95*	-0.3640	-1.44	-0.0493	-0.49	0.4980	2.01**
LEVER	0.0335	0.44	0.1989	0.96	-0.0718	-1.09	-0.0748	-0.47
PROFIT	0.0440	1.18	0.2414	2.39**	-0.0093	-0.24	-0.0259	-0.28
LIQ	0.0017	0.86	0.0148	2.81***	0.0099	5.70***	0.0027	0.63
CAP	0.0028	0.02	-0.0768	-0.22	0.0177	0.25	-0.1087	-0.64
PT	-0.1472	-1.65	-0.1094	-0.44	-0.0938	-1.09	-0.1849	-0.84
Bank-type	0.4275	5.25***	0.6246	2.76***	0.3849	4.57***	0.4293	1.99**
_cons	-0.4703	-3.21***	0.9988	2.52***	-0.9391	-4.05***	1.8880	3.33***
	R-sq= 0.3938 Prob>chi2= 0.0001		R-sq= 0.1982 Prob>chi2= 0.0001		R-sq= 0.3786 Prob>chi2= 0.0001		R-sq= 0.1854 Prob>chi2= 0.0001	

Big4= is a dummy variable the takes the value of one if the largest four auditing firms audit the bank and zero otherwise, ***Co-audit=*** A dummy variable that takes 1 if a bank is audited by two audit firms and 0 otherwise, ***A-Opin=*** a dummy variable that takes 1 if auditor issued a going-concern opinion, and 0 otherwise, ***IAC=*** is measured as the number of independent directors on the audit committee scaled by the total number of audit committee members, ***ACZ=*** represents the size of the audit committee, ***ACM=*** stands for the total number of audit committee meeting held in a financial year, ***Bank-s=*** is measured as a natural logarithm of total assets, ***Growth=*** is calculated as the change in total assets scaled by the lag of total assets, ***LEVER=*** is measured as total liabilities divided by total assets, ***PROFIT=*** is calculated as net income scaled by the lag of total assets, ***LIQ=*** is measured as current assets scaled by current liabilities, ***CAP=*** represents capital adequacy ratio and is measured as the proportion of actual regulatory capital (Tier 1 capital) divided by the total assets, ***PT=*** is a dummy variable that takes the value of one if a bank is based in Egypt, Yemen, Syria, Tunisia, or Iraq and zero otherwise. ***Bank-type***= is a dummy variable that assigns 1 to Islamic banks and 0 to conventional banks.

Table 12 Robustness test (Panel A) high-growth, Profitability, low-leverage

	H-Growth				H-Profitability				L-Leverage			
Variables	**CR1**		**CR2**		**CR1**		**CR2**		**CR1**		**CR2**	
	Coef.	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**
Q_VD	0.5014	3.88***	2.0743	6.32***	0.4622	2.88***	2.4874	6.46***	0.3158	2.12**	1.4654	4.19***
Big4	0.1566	5.00***	0.1242	1.75*	0.2087	5.95***	0.4987	5.93***	0.1024	3.10***	0.1441	1.85*
Co-audit	0.1324	2.18**	0.2143	1.88*	0.2155	3.15***	0.4262	2.36***	0.1849	2.99***	0.1244	1.79*
A-Opin	0.0947	1.01	-0.0854	-0.35	-0.2082	-2.16**	-0.3222	-1.37	-0.2260	-2.58***	-0.2947	-1.39
IAC	0.0021	0.06	0.2576	2.78***	0.0438	1.01	-0.1396	-1.34	-0.0488	-1.29	0.1021	1.15
ACZ	0.0079	0.54	0.0760	2.03**	-0.0040	-0.24	0.0521	1.29	0.0119	0.76	0.1218	3.31***
ACM	0.0273	1.97**	0.0116	0.33	-0.0016	-0.10	-0.0351	-0.89	0.0313	2.20**	0.0246	0.72
Bank-s	0.0017	0.74	0.0090	1.45	-0.0045	-2.19**	0.0029	0.59	0.0006	0.24	0.0018	0.32
Growth	1.4279	3.42***	1.012	0.95	-0.0879	-0.93	-0.1356	-0.60	0.0102	0.05	0.5556	1.13
LEVER	-0.0774	-1.07	-0.2567	-1.40	0.0062	0.08	0.0784	0.43	-0.4329	-2.00**	1.0107	1.83*
PROFIT	0.0281	0.84	0.1969	2.32**	0.1854	0.50	0.8581	0.95	0.0378	0.86	0.1596	1.50
LIQ	0.0026	0.72	0.0049	0.53	0.0085	4.58***	0.0103	2.34**	-0.0029	-0.76	-0.0005	-0.06
CAP	0.2812	2.28**	0.7655	2.41***	0.3053	2.33**	-0.8237	2.56***	0.3465	2.54***	-0.1813	-0.56
PT	-0.0866	-0.99	-0.0735	-0.29	-0.0518	-0.48	-0.0606	-0.20	-0.1189	-1.35	-0.4521	-1.78*
Bank-type	0.3770	4.27***	0.4267	1.69*	0.3966	4.28***	0.7602	2.84***	0.4633	5.55***	0.6621	2.79***
_cons	0.1210	0.91	1.9925	5.71***	0.1410	1.84*	1.8733	4.46***	-0.5786	-2.40***	1.2936	2.13**
	R-sq= 0.3887		R-sq= 0.1873		R-sq= 0.3063		R-sq= 0.2766		R-sq= 0.4143		R-sq= 0.1613	
	Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001	

Q_VD= stands for the quality of voluntary disclosure, ***Big4=*** is a dummy variable the takes the value of one if the largest four auditing firms audit the bank and zero otherwise, ***Co-audit=*** A dummy variable that takes 1 if a bank is audited by two audit firms and 0 otherwise, ***A-Opin=*** a dummy variable that takes 1 if auditor issued a going-concern opinion, and 0 otherwise, ***IAC=*** is measured as the number of independent directors on the audit committee scaled by the total number of audit committee members, ***ACZ=*** represents the size of the audit committee, ***ACM=*** stands for the total number of audit committee meeting held in a financial year, ***Bank-s=*** is measured as a natural logarithm of total assets, ***Growth=*** is calculated as the change in total assets scaled by the lag of total assets, ***LEVER=*** is measured as total liabilities divided by total assets, ***PROFIT=*** is calculated as net income scaled by the lag of total assets, ***LIQ=*** is measured as current assets scaled by current liabilities, ***CAP=*** represents capital adequacy ratio and is measured as the proportion of actual regulatory capital (Tier 1 capital) divided by the total assets, ***PT=*** is a dummy variable that takes the value of one if a bank is based in Egypt, Yemen, Syria, Tunisia, or Iraq and zero otherwise. ***Bank-type***= is a dummy variable that assigns 1 to Islamic banks and 0 to conventional banks.

Table 12 Robustness test (Panel B) (Before & After Crisis)

	Before-Crisis				After-Crisis			
Variables	**CR1**		**CR2**		**CR1**		**CR2**	
	Coef.	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**
Q_VD	0.9814	4.61***	3.4176	6.29***	0.3951	3.59***	1.8804	6.91***
Big4	0.0579	1.85*	0.2008	1.97**	0.1867	6.77***	0.3030	4.45***
Co-audit	0.2777	4.10***	0.8390	4.66***	0.1430	2.78***	0.4548	3.53***
A-Opin	-0.0006	-0.01	0.0872	0.23	0.0607	0.93	-0.0097	-0.06
IAC	0.0782	1.53	0.2768	2.13**	0.0132	0.39	0.0625	0.75
ACZ	0.0302	1.47	0.1422	2.70***	0.0100	0.81	0.0441	1.43
ACM	0.0006	0.3	-0.0517	-0.84	0.0002	0.01	-0.0209	-0.76
Bank-s	-0.0052	-1.69	-0.0279	-3.45***	-0.0033	-2.34**	0.0058	1.66*
Growth	0.0424	0.33	0.4870	1.49	0.0197	0.26	0.0362	0.20
LEVER	-0.0887	-0.96	-0.6064	-2.55***	-0.0682	-1.25	-0.1595	-1.18
PROFIT	0.0659	0.98	-0.1628	-0.91	-0.0030	-0.10	0.0698	0.89
LIQ	0.0048	1.43	-0.0024	-0.28	0.0068	5.32***	-0.0030	-0.95
CAP	-0.0087	-0.08	-0.1046	-0.39	-0.0616	-0.80	-0.2323	-1.21
PT	-0.1670	-1.66*	-0.4834	-1.69*	-0.1107	-1.34	-0.0898	-0.43
Bank-type	0.5215	5.30***	1.2844	4.66***	0.3151	4.02***	0.3635	1.82*
_cons	-0.6102	-3.01***	0.4299	1.98**	0.0667	1.60*	2.5007	9.03***
	R-sq= 0.3307		R-sq= 0.4609		R-sq= 0.3351		R-sq= 0.1690	
	Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001	

Q_VD= stands for the quality of voluntary disclosure, ***Big4=*** is a dummy variable the takes the value of one if the largest four auditing firms audit the bank and zero otherwise, ***Co-audit=*** A dummy variable that takes 1 if a bank is audited by two audit firms and 0 otherwise, ***A-Opin=*** a dummy variable that takes 1 if auditor issued a going-concern opinion, and 0 otherwise, ***IAC=*** is measured as the number of independent directors on the audit committee scaled by the total number of audit committee members, ***ACZ=*** represents the size of the audit committee, ***ACM=*** stands for the total number of audit committee meeting held in a financial year, ***Bank-s=*** is measured as a natural logarithm of total assets, ***Growth=*** is calculated as the change in total assets scaled by the lag of total assets, ***LEVER=*** is measured as total liabilities divided by total assets, ***PROFIT=*** is calculated as net income scaled by the lag of total assets, ***LIQ=*** is measured as current assets scaled by current liabilities, ***CAP=*** represents capital adequacy ratio and is measured as the proportion of actual regulatory capital (Tier 1 capital) divided by the total assets, ***PT=*** is a dummy variable that takes the value of one if a bank is based in Egypt, Yemen, Syria, Tunisia, or Iraq and zero otherwise. ***Bank-type***= is a dummy variable that assigns 1 to Islamic banks and 0 to conventional banks.

Table 13 Addressing Endogeneity (Panel A) Lagged variable

	Full sample				Conventional banks				Islamic banks			
Variables	**CR1**		**CR2**		**CR1**		**CR2**		**CR1**		**CR2**	
	Coef.	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**
Q_VD	0.4642	4.10***	2.0095	7.02***	0.2902	2.39**	1.6768	4.99***	0.4204	1.78*	1.9055	3.56***
Big4	0.1705	7.13***	0.2412	3.99***	0.1575	5.63***	0.0612	1.79	0.1983	4.37***	0.5794	5.64***
Co-audit	0.1356	2.92***	0.5068	4.27***	0.1466	2.68***	0.6332	4.26***	0.0607	1.74*	0.4281	2.24**
A-Opin	-0.0169	-0.27	-0.1208	-0.77	-0.1431	-2.48***	-0.2639	-1.66*	-0.6431	-3.15***	-0.6150	-1.30
IAC	-0.0463	-1.55	0.1522	2.15**	0.0572	1.93*	0.3027	3.70***	0.0998	1.63	0.3108	2.23**
ACZ	0.0196	1.82*	0.1157	4.25***	0.0254	2.25**	0.1380	4.42***	0.0147	0.61	0.0536	0.97
ACM	0.0229	2.36***	0.0305	1.24	0.0538	5.21***	0.0476	1.67*	0.0407	1.90*	-0.0317	-0.65
Bank-s	-0.0047	-3.50***	-0.0013	-0.40	0.0062	3.74***	-0.0013	-0.29	-0.0026	-1.09	-0.0006	-0.11
Growth	-0.0333	-0.49	-0.0160	-0.09	-0.0703	-0.79	0.0705	0.29	-0.1317	-1.17	-0.0586	-0.23
LEVER	-0.0788	-1.58	-0.0454	-0.36	-0.0448	-0.77	-0.0260	-0.16	0.0751	0.74	0.0911	0.40
PROFIT	-0.0209	-0.77	0.0692	1.00	0.0133	0.53	0.0750	1.08	0.0267	0.18	-0.3145	-0.93
LIQ	0.0065	5.33***	0.0004	0.14	0.0174	9.45***	0.0127	2.49***	0.0017	0.94	-0.0066	-1.60
CAP	-0.0063	-0.10	-0.0657	-0.39	0.0328	0.53	-0.0325	-0.19	0.0557	0.27	-0.2706	-0.55
PT	-0.1315	-1.64	-0.1330	-0.63	-0.1269	-1.55	0.0214	0.10	-0.0588	-0.27	-1.3899	-2.60***
Bank-type	0.3836	5.08***	0.4740	2.40***	-	-	-	-	-	-	-	-
LQ_VD	0.1772	1.72*	0.2762	1.02	0.1138	1.01	0.2688	0.86	0.2490	1.15	0.3824	0.78
_cons	-0.2607	-2.46***	1.9198	7.12***	-0.3576	-3.22***	1.8282	5.99***	0.2933	1.71*	2.8080	5.60***
	R-sq= 0.2902		R-sq= 0.1626		R-sq= 0.2648		R-sq= 0.1778		R-sq= 0.1482		R-sq= 0.4053	

Prob>chi2= 0.0001	Prob>chi2= 0.0001	Prob>chi2= 0.0001	Prob>chi2= 0.0001	Prob>chi2= 0.0001	Prob>chi2= 0.0001

Q_VD= stands for the quality of voluntary disclosure, ***Big4=*** is a dummy variable the takes the value of one if the largest four auditing firms audit the bank and zero otherwise, ***Co-audit=*** A dummy variable that takes 1 if a bank is audited by two audit firms and 0 otherwise, ***A-Opin=*** a dummy variable that takes 1 if auditor issued a going-concern opinion, and 0 otherwise, ***IAC=*** is measured as the number of independent directors on the audit committee scaled by the total number of audit committee members, ***ACZ=*** represents the size of the audit committee, ***ACM=*** stands for the total number of audit committee meeting held in a financial year, ***Bank-s=*** is measured as a natural logarithm of total assets, ***Growth=*** is calculated as the change in total assets scaled by the lag of total assets, ***LEVER=*** is measured as total liabilities divided by total assets, ***PROFIT=*** is calculated as net income scaled by the lag of total assets, ***LIQ=*** is measured as current assets scaled by current liabilities, ***CAP=*** represents capital adequacy ratio and is measured as the proportion of actual regulatory capital (Tier 1 capital) divided by the total assets, ***PT=*** is a dummy variable that takes the value of one if a bank is based in Egypt, Yemen, Syria, Tunisia, or Iraq and zero otherwise. ***Bank-type***= is a dummy variable that assigns 1 to Islamic banks and 0 to conventional banks, and ***LQ_VD***= is the lagged value of Q_VD.

Table 13 Addressing Endogeneity (Panel B) 2SLS (Bank-type as Instrumental Variable)

Full sample				
Variables	**CR1**		**CR2**	
	Coef.	**Z**	**Coef.**	**Z**
Q_VD	0.5017	4.99***	1.8763	7.38***
Big4	0.1704	7.13***	0.2410	3.99***
Co-audit	0.1353	2.91***	0.5077	4.27***
A-Opin	0.0173	0.28	-0.1241	-0.79
IAC	0.0472	1.69*	0.1560	2.20**
ACZ	0.0195	1.82*	0.1157	4.25***
ACM	0.0230	2.36***	0.0309	1.25
Bank-s	-0.0047	-3.47***	0.0011	0.34
Growth	-0.0314	-0.47	0.0096	0.06
LEVER	-0.0778	-1.56	-0.0499	-0.40
PROFIT	0.0202	0.74	0.0711	1.03
LIQ	0.0065	5.32***	-0.0003	-0.11
CAP	0.0076	0.12	-0.0680	-0.41
PT	-0.1316	-1.63	-0.1319	-0.62
_cons	-0.2368	-2.35***	1.8328	7.13***
Robust Cluster	YES		YES	
	Prob>chi2= 0.0001 R-sq= 0.3494		Prob>chi2= 0.0001 R-sq=0.1528	

Table 13 Addressing Endogeneity (Panel C) GMM model

	Full sample				Conventional banks				Islamic banks			
Variables	**CR1**		**CR2**		**CR1**		**CR2**		**CR1**		**CR2**	
	Coef.	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**	**Coef.**	**Z**
Q_VD	0.6887	4.06***	2.3923	4.27***	0.2859	2.20**	1.9744	3.09***	0.8845	2.67***	2.6161	3.34***
Big4	0.1288	2.93***	0.3474	2.77***	0.1331	3.41***	0.1945	1.90**	0.1588	2.19**	0.5945	2.60***
Co-audit	0.1376	1.68*	0.3486	0.92	0.1812	1.88*	0.8440	1.74*	0.0173	1.74*	0.2485	1.73*
A-Opin	0.0638	0.45	-0.0122	0.07	-0.1372	-1.47	-0.1542	-0.80	-0.5403	-3.43***	-0.6713	-2.27**
IAC	0.0139	0.41	0.2399	2.43***	0.0070	-0.22	0.3103	2.30**	0.0242	0.39	0.0065	0.05
ACZ	0.0275	-1.61	0.0012	0.03	0.0035	0.20	0.0600	0.88	0.0239	0.91	0.0487	0.80
ACM	0.0337	1.89*	0.0591	1.42	0.0148	-0.80	0.0258	0.45	0.0649	2.58***	0.1053	1.35
Bank-s	-0.0041	-1.87*	-0.0021	-0.34	-0.0051	-1.99**	-0.0072	-0.93	-0.0017	-0.56	-0.0061	-0.87
Growth	0.1196	1.19	0.5289	1.62	-0.1825	-1.34	0.7322	2.09**	-0.0240	-0.25	0.1882	0.51
LEVER	-0.1110	-1.35	0.0838	0.62	-0.0807	-0.96	0.3321	1.65	-0.1618	-1.31	-0.1951	-0.70
PROFIT	0.0242	0.70	0.0161	0.20	0.0576	1.58	0.0623	0.69	0.0831	0.37	0.8871	1.99**
LIQ	0.0083	2.55***	-0.0009	-0.14	0.0238	7.29***	0.0140	0.98	0.0002	0.18	-0.0076	-1.21
CAP	0.0408	0.17	-0.1426	-0.94	0.1083	0.62	-0.2604	-2.11**	-0.6691	-1.56	0.3887	0.42
PT	0.0682	0.91	0.5306	2.21**	0.0823	1.22	0.7275	2.96***	0.4898	4.48***	-0.3112	-3.18***
Bank-type	0.4722	6.51***	0.4043	5.81***	-	-	-	-	-	-	-	-
_cons	-0.0705	-0.48	0.5302	1.07	-0.0875	-0.56	0.2350	0.35	0.3666	1.90*	1.9148	2.21**
Robust Cluster	YES		YES		YES		YES		YES		YES	
	Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001		Prob>chi2= 0.0001	

Appendix 1: Variables measurement and definition

	Symbol	Definition	Source	
Dependent variables	CR1	is measured as a dummy variable encoded 1 if the bank is rated between AAA to A- levels and 0 otherwise.	Credit rating agencies (Fitch and Standards and Poor's)	Oh and Park., (2017) and Grassa et al., 2020
	CR2	is measured by using a score between 1 for the lowest-rated bank to 7 for the highest-rated bank.	Credit rating agencies (Fitch and Standards and Poor's)	Grassa et al., (2020); Hui et al., (2020); Oh and Park., (2017)
Independent variables	Q_VD	stands for the quality of voluntary disclosure	Annual reports	Salem et al., (2020) and Beretta and Bozzolan, (2008) and Alotaibi and Hussainey (2016)
	Big_4	is a dummy variable that takes the value of one if the largest four auditing firms auditing the bank and zero otherwise.	DataStream	Sahyoun and Magnan., (2020); Ahmadi and Bouri., (2019) and Zalata et al., (2020)
	Co-audit	A dummy variable that takes 1 if a bank is audited by two audit firms and 0 otherwise	DataStream/ Annual reports	Tepalagul and Lin, (2015) and Salem et al, (2021); Zerni et al., (2012)
	A-Opin	a dummy variable that takes 1 if the auditor issued a going-concern opinion and 0 otherwise.	Annual reports	Strickett & Hay, (2015); Siregar et al., (2020)
Control variables	IAC	is measured as the number of independent directors on the audit committee scaled by the total number of audit committee members,	DataStream/ Annual reports	Salem et al, (2021) and Tepalagul and Lin, (2015)
	ACZ	represents the size of the audit committee	DataStream/ Annual reports	Salem et al, (2020) and Salem et al, (2021)
	ACM	stands for the total number of audit committee meetings held in a financial year	DataStream/ Annual reports	Salem et al, (2020) and Salem et al, (2021)
	Bank-s	is measured as a natural logarithm of total assets	DataStream	Abdelsalam et al., (2016); Adams et al., (2003); Ahn et al., (2019) and Alali et al., (2012)
	Growth	is calculated as the change in total assets scaled by the lag of total assets	DataStream	
	LEVER	is measured as total liabilities divided by total assets,	DataStream	Alali et al., (2012); Salem et al, (2021) and Delis et al., (2021)
	PROFIT	is calculated as net income scaled by the lag of total assets	DataStream	Alali et al., (2012); Delis et al., (2021) and Abdelsalam et al., (2016)
	LIQ	is measured as current assets scaled by current liabilities	DataStream	
	CAP	represents capital adequacy ratio and is measured as the proportion of actual regulatory capital (Tier 1 capital) divided by the total assets	DataStream	Abdelsalam et al., (2016) and Delis et al., (2021)
	PT	is a dummy variable that takes the value of one if a bank is based in Egypt, Yemen, Syria, Tunisia, or Iraq and zeroes otherwise.	The Global Economy https://www.theglobaleconomy.com/rankings/wb_political_stability/MENA/	Abdelsalam et al., (2016) and Salem et al, (2021)
	Bank-Type	is a dummy variable that assigns 1 to Islamic banks and 0 to conventional banks.	DataStream	Abdelsalam et al., (2016) and Salem et al, (2021)