Received 13 September 2020
Revised 27 October 2020
22 November 2020
7 December 2020
19 January 2021
2 March 2021
Accepted 14 March 2021

Bank efficiency and practice of earnings management: a study on listed commercial banks of Bangladesh

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Abstract

Purpose – The purpose of the study is to determine the relationship between bank efficiency in terms of corporate governance guidelines and the extent of practice of earnings management (EM).

Design/methodology/approach – Archival data of listed private commercial banks of Dhaka Stock Exchange over the period of 2007–2016 relating to corporate governance and earnings management are collected and analyzed using parametric and non-parametric methods (efficiency analysis) and applying panel regression analysis.

Findings – The same distribution pattern and have low degree of the correlation (0.248) among them. It is found that private commercial banks of Bangladesh, on average, display efficiency level of 80.84%. The average value of discretionary loan loss provision (i.e. measure of earnings management) is 0.4249 and this indicates the presence of earnings management. The relation between earnings management and efficiency score in both cases of two-step system generalized methods of moments (GMMs) and difference GMM are found to be negative. The negative coefficients (−0.7969 and −0.57) indicate that as the efficiency increases, the practice of earnings management by the private commercial bank reduces. By estimating efficiency based on corporate governance guidelines and detecting the existence of EM, the major contribution of the study is establishing the relationship between bank efficiency based on compliance with corporate governance guidelines and managerial practice of earnings management in Bangladesh. Empirical results of the study have also established the fact that the more efficient the management of the banks are, the less likely it will practice earnings management under the compliance of corporate governance guidelines in Bangladesh.

Research limitations/implications – This research study has some limitations. Only conventional banks are considered for the study, with the exception of Islamic banks. Comparison between conventional banks and Islamic banks could have been done.

Practical implications – Based on the literature study, the effectiveness of corporate governance aligns with decreasing agency conflict, protection of shareholders' interests and restrain management from self-serving activities (i.e. practice of earnings management). The empirical results of the study established these facts. Regulators should give more emphasis on effective implementation of good governance.

Originality/value – To the best of the authors' knowledge, this may be the first to empirically determine the relationship between efficiency estimation based on corporate governance and earnings management in case of listed commercial banks of Bangladesh.

Keywords Earnings management, Corporate governance, Efficiency analysis, Data envelopment analysis, Stochastic frontier analysis, Panel regression analysis, Private commercial banks

Paper type Research paper

Asian Journal of Accounting Research
Vol. 7 No. 2, 2022
pp. 114-128
Emerald Publishing Limited
2443-4175
DOI 10.1108/AJAR-09-2020-0080

1. Introduction

Earnings management (EM) has received considerable attention in recent years. Schipper (1989) defines EM as managerial intention for manipulation in the financial reporting process to achieve some private gains. EM is practiced for two purposes: to hide the "true" financial performance of a company in order to mislead users of the financial reports and to convey private information to the investors for signaling purposes (Makhaiel and Sherer, 2017). Strict financial regulation, practice of good governance, strong audit mechanism and ethical practice in financial reporting can help reduce the practice of EM (Leventis *et al.*, 2010). EM is also considered as a major challenge for effective implementation of corporate governance mechanism. The practice of prudent corporate governance could mitigate the practice of EM in listed companies (Wei, 2007).

Corporate governance models in any country are mostly influenced by country-specific situations. It is claimed that none of the corporate governance model is said to be ideal in all dimensions. In Bangladesh, organizations follow a hybrid system of corporate governance. The corporate control mechanism adopted in Bangladesh is like those of other countries such as Germany, Japan and East Asia, where the control mechanism is highly concentrated under an ownership control approach. Like Anglo-American countries, independent directors are on the board of directors. Bangladeshi companies are mostly owned by families. Family members play key roles for incorporation of the company and provide venture capital. Board of directors is composed of both executive directors and non-executive directors (independent directors). In case of Bangladesh, boards of directors are composed mostly of family/persons keen to them. Institutional shareholders' are not participating in decision-making process (Biswas, 2012).

In this study, the role of corporate governance guidelines in constraining the practice of EM is explored. It is expected that the more efficient the bank is in terms of complying with the present corporate governance guidelines, the less the management of banks will practice EM. Banks play an important role for the development of any economy. Measuring banks' efficiency helps policymakers formulate appropriate policies for smooth functioning of commercial banks (Mester, 1997). There has been a plethora of studies dealing with measuring the banking efficiency worldwide, but the majority of the studies has been undertaken in developed countries (Mollah and Zaman, 2015; Lehmann *et al.*, 2004; Cornett *et al.*, 2006, 2009). Studies determining the bank efficiency were conducted in Bangladesh, but in a limited number (Ahmed and Liza, 2013; Yasmeen, 2011; Uddin and Suzuki, 2011). In addition, comparing the efficiency scores using different methodologies are scarce. To address this gap, this study posits the following research question – how efficient are private commercials banks (PCBs) based on compliance with corporate governance guidelines in Bangladesh? In this connection, specific focus is given to the internal corporate governance.

This study considers PCBs listed in Dhaka Stock Exchange and Chittagong Stock Exchange, which are regulated separately under the Banking and Financial Institutions Act, 1993. The study relied upon panel data analysis spanning the period from 2007 to 2016 since the corporate governance guidelines were provided by the Bangladesh Security Exchange Commission in 2006 that required every listed company to comply with corporate governance guidelines. To identify the practice and motives of EM, accrual-based earnings management model is used. For efficiency analysis, the parametric approaches and non-parametric approaches to measure efficiency are applied. Lastly, in order to determine the relationship between bank efficiency based on corporate governance guidelines and EM practices, dynamic panel estimation (generalized methods of moments) is used. This study may be the first one to analyze efficiency of PCBs in Bangladesh considering the corporate governance variables as input variables along with other relevant variables. Both the parametric and non-parametric methods are used for efficiency measurement. Another contribution of the study is to determine the relationship between bank efficiency in terms of

corporate governance guidelines and the extent of earnings management. The rest of the paper is structured as follows: section two deals with literature review, section three presents the methodology, followed by section four that presents the results and discussions. Last section presents the conclusions with the some policy implications based on the findings.

2. Literature review

2.1 Efficiency analysis based on corporate governance guidelines

The efficiency concept can be used in case of banking industry from the various aspects (Mahbub, 2016; Mester, 1997).The study of efficiency in banking industry is vital for three important reasons: first, banks must gain cost efficiency. By gaining higher profits, banks could increase survival rate in competitive market. Second, it is important to measure operational efficiency. Third, it will help policymakers to formulate policies (Mester, 1997). Kusuma and Ayumardani (2016) studied the effect of corporate governance on the performance of Islamic bank in Indonesia for the period of 2010–2014. Using data envelopment analysis (DEA), their findings show that the efficiency level is significantly correlated with bank performance under a corporate governance guideline. Karimzadeh (2012) studied the efficiency of commercial banks over the years 2000–2010 in India, and the findings revealed that public banks are more efficient than their peers of private banks over the study periods. Salim *et al.* (2016) studied the relationship between corporate governance and bank efficiency for the period 1999–2013 in Australia. Using five corporate governance variables, they found that size of the board and the numbers of committee meetings have positive and significant impact on efficiency. Moreover, their study also revealed that the overall efficiency of the banking industry was improved after the introduction of good corporate governance in Australia. Zeineb and Mensi (2018) investigated the effect of corporate governance on bank efficiency and risk of Gulf Cooperation Council Islamic banks. Size of the board, duality role of chief executive officers and ownership structure are included as the corporate governance variables and risk is used to measure efficiency using DEA. Mollah and Zaman (2015) found that efficiency of Islamic banks increase with the presence of Shariah board. Based on the above discussion, the present study posits the following hypothesis:

H1. PCBs complying with the corporate governance guidelines are technically efficient.

Studies on efficiency analysis using different methods are available. Sheldon (1994) estimated the cost efficiency using both the stochastic frontier analysis (SFA) and DEA of Swiss banks, but found no relationship among the rankings of efficiency scores. Kuchler (2013) studied Danish banks' efficiency before and during the crisis period of 2001–2012 using DEA and SFA. The correlation between the efficiency ranking (DEA and SFA) was not perfect, but was in a low degree over the years. Silva *et al.* (2016) examined the efficiency of Chinese local banks using of DEA and SFA methods and they found a consistent trend in global efficiency score. It was found that rank correlation was relatively small and diverged about individual performance diagnoses. Nguyen *et al.* (2016), from 2000 to 2014, examined Vietnamese banks' cost efficiency using of SFA and DEA methods. They found consistent results under both methods. In Bangladesh, there are a few studies available regarding comparison of the two approaches. Robin *et al.* (2017) estimated cost efficiency of commercial banks under the context of financial reform over the period of 1983–2012. The scores of DEA and SFA obtained did not vary significantly. Based on the above discussions, the present study posits the following hypotheses:

H2. Efficiency scores obtained from different approaches follow the same distribution pattern.

H3. Efficiency scores across different methods correlate with each other.

2.2 Earnings management practices and corporate governance

Studies regarding detection of EM using of specific accruals are found throughout the world, but most of the studies relied upon developed countries. The specific accruals-based techniques are based on using loan loss provision (LLP) for EM purposes (Beatty *et al.*, 1995; Cornett *et al.*, 2006, 2009; Kanagaretnam *et al.*, 2010; Anandarajan *et al.*, 2003, 2007; Leventis *et al.*, 2010). LLP can be defined as the accumulated sum of funds to meet unexpected loss in the future for credits (loans and advances) given by banks. Accounting standards and generally accepted accounting principles provide some flexibility regarding recording of financial events (LLP, for an example) that create scope for managers to use LLP to smooth earnings (Kanagaretnam *et al.*, 2010).

Agency theory also claims that ownership structure could help implement a good corporate governance mechanism. This could lead to quality financial reporting and less practice of EM, whereas managerial ownership has a positive relationship with EM practice. The more the outside (independent) directors are in different committees; the better the performance of the company will be (Sanchez and Meca, 2005). According to Almasarwah (2015), internal corporate governance is considered to be proactive mechanism for sound functioning of any firm with support from regulatory bodies. Agency theory assumes that board members can influence and monitor every activity of the management. Several studies have shown the effects of corporate governance mechanism on practice of EM. All those studies are conducted to show the specific aspects of corporate governance (board structure, audit structure, ownership structure, independent director and board diversity) in relation to EM (Farraz *et al.*, 2011; Razzaque *et al.*, 2016) . It is found in literature that with increase of EM practices, banks' efficiency is reduced significantly (Ab-Hamid *et al.*, 2018).This study combines two aspects – bank efficiency based on corporate governance guidelines and extent of practice of EM. Considering this relationship, the present study is conducted to answer the question: does the management of efficient banks indulge in less practice of the earnings management in Bangladesh? Therefore, this study posits the following hypothesis:

H4. The management of efficient banks practice less earnings management.

3. Methodology

This study is based on two concepts like efficiency estimation and earning management. This study relies upon frontier analysis and both the non-parametric approaches and parametric approaches to measure efficiency. DEA is used to identify the technical efficiency in private PCBs of Bangladesh. In order to check robustness of the results estimated using of DEA methods, stochastic frontier analysis (SFA) is also conducted. Software, DEAP 2.1 and Frontier 4.1 versions are used to determine the efficiency scores in this study. To identify the practice and motives of EM, specific accrual-based model is used. For determining the relationship between bank efficiency based on corporate governance guidelines and EM practices, dynamic panel estimation (GMM) is used. The GMM permits dealing with the problems of serial correlation, heteroskedasticity and endogeneity in a model (Alimi, 2015). Thus, a panel data GMM is used to control the dynamic nature of data of efficiency and EM practices. Stata 13.0 version is used to conduct the panel regression and GMM regression analysis.

3.1 Data envelopment analysis (DEA)

DEA was developed by Charnes *et al.* (1978) (hereafter CCR) in 1978. The DEA approach is a linear programming technique. It is used to calculate efficiency scores of the efficient decision-

making units (DMUs) applying minimum level of inputs to produce optimum level output where production function is unknown. For measuring elative efficiency, multiple inputs and multiple outputs are used to generate a frontier consisting of the best performing DMUs. Generally, a common set of weights are applied to all units. There are also two measurement scales: constant returns to scale (CRS) and variable returns to scale (VRS). CRS assumption is considered appropriate when all DMUs under study are operating at optimum scale (Mahbub, 2016). In line with the Lehmann *et al.* (2004) and Al-Hussain (2009), this study calculated the efficiency scores of PCBs based on compliance with regard to corporate governance guidelines. The efficiency scores are used to explain bank performance. Let us consider, "*n*" represents productive units and DMUs and "*m*" represents different inputs which produce different outputs. The model for DEA analysis is as follows:

$$\text{Max}h_0 = \frac{\sum_{r=1}^{s} u_r v_{rj}}{\sum_{i=1}^{m} v_i x_{ij}} \tag{1}$$

where, $\text{Max}h_0 = \frac{\sum_{r=1}^{s} u_r v_{rj}}{\sum_{i=1}^{m} v_i x_{ij}} \leq 1$, "*j*" stands for individuals bank (1, 2,.....*n*), *u* and *v* stand for the weight $u_r > 0$ and $v_i > 0$, "*r*" stands for inputs of different companies and "*i*" stands for outputs of different companies. The above DEA model is a fractional linear program. To convert it the linearization process is done through setting the denominator equal to a constant and maximizing the numerator. The resultant linear program is as follows:

$$\text{Max}h_0 = \sum_{r} u_r y_{rj0} \tag{2}$$

Subject to: $\sum_r u_r y_{rj0} - \sum_i v_i y_{rj0} \leq o \ldots j = 1, 2, \ldots n$

The dual linear programming of the problem is written as follows: $\text{Min}(\lambda)\theta_0$

Subject to: $\sum_{i=1}^{N} \lambda_i y_{ri} \geq y_{r0} r = 1, 2, \ldots s$

$$\theta_0 X_{k_0} - \sum_{i=1}^{N} \lambda_i X_{ji} \geq 0 \ldots j = 1, 2, \ldots k; \lambda \geq 0$$

The value of "θ" is the efficiency score, and the value of one indicates that DMUs are technically efficient and lying on the production frontier. The above formulation is based on CRS (Lehmann *et al.*, 2004).

3.2 Stochastic frontier analysis (SFA)

SFA estimates the best possible practices for a given cost function and profit function. The specification of the model uses the production function with cross-sectional data. The error term is composed of two components: random effects and technical inefficiencies. The model is expressed as follows:

$$Y_i = x_i\beta + (v_i - u_i) \tag{3}$$

where, Y_i is the output of individual firm, X_i is the vector of input quantities of individual specific firm; β is the vector of the unknown parameters and v_i is the random error added to the non-negative inefficiency term, u_i. The random error v_i, contains measurement error and other random factors affecting the output variable. The model is stochastic because the upper limit is determined based on stochastic variable. The random error v_i, can be positive and negative (Coelli, 1996; Coelli *et al.*, 2005). In the SFA method, it is vital to specify the production technology and the distribution of inefficient terms. This study is based on translog function to estimate production efficiency. Translog specification of production function can be more

useful than Cobb–Douglas specification in terms of best fitted model (Berger *et al.*, 2009). The translog equation is specified as follows:

$$\ln Y_{it} = \beta_0 + \beta_1 \ln C_{it} + \beta_2 \ln L_{it} + (1/2)\left[\beta_{11}(\ln C_{it})^2 + \beta_{22}(\ln L_{it})^2 + \beta_{12}(\ln C_{it})(\ln L_{it})\right] + \beta_{13}(\ln C_{it})t + \beta_{23}(\ln L_{it})t + \beta_{33}t^2 + v_{it} - u_{it} \quad (4)$$

Where L and C represent the vector of the logarithm of input variables used in a study and Y is the output.

3.3 Estimation of earnings management practices

Several techniques are discussed in the previous section to determine the practice of earnings management (EM). However, it is found that most of the techniques are attributed toward real or accrual management practices and are used in non-financial industry. The Jones model and the modified Jones model are found to be the most popular among the academicians, but their models exclude financial firms. The reason for discarding financial firms was their specific nature of business under highly regulated business environment. On the other hand, the banking literature has adopted the specific accrual methodology based on loan loss provision (LLP). LLP is considered as the most relevant and discretionary component in case of detecting EM in banking industry (Francies *et al.*, 2016). Studies regarding detection of EM using of specific accruals are found throughout the world, but most of the studies were upon developed countries. The specific accruals-based techniques are based on LLP for EM detection purposes (Beatty *et al.*, 1995; Cornett *et al.*, 2006, 2009; Kanagaretnam *et al.*, 2010; Anandarajan *et al.*, 2003, 2007; Leventis *et al.*, 2010). One of the most widely used methods of specific accruals was introduced by Beatty *et al.* (1995). Their study compared public and private bank companies of the USA by considering two components of financial statement: LLP and realized security gain and losses. The following equation is estimated to determine the existence of EM. The error term is considered as the discretionary part.

$$\text{Loss}_{it} = \alpha_{it} + \beta_1 \text{LASSET}_{it} + \beta_2 \Delta\text{NPL}_{it} + \beta_3 \text{LLR}_{it} + \beta_4 \text{LOANC}_{it} + \beta_5 \text{LOAND}_{it} + \beta_6 \text{LOANA}_{it} + \beta_7 \text{LOANI}_{it} + \beta_8 \text{LOANF}_{it} + \varepsilon_{it} \quad (5)$$

Where, loss is loan loss provision; LASSET is the natural logarithm of total assets; NPL is change in non-performing loans; LLR is loan loss reserve; LOANR is loan to real estate; LOANC is commercial and industrial loans; LOAND is loans to depository institutions; LOANA is loan to finance agricultural production and LOANF is loans to foreign governments. All the variables are expressed as a percentage of total loans.

$$\text{LLP}_{i,t} = \alpha_0 + \alpha_1 \text{LnTA}_{it} + \alpha_2 \text{NPL}_{i,t} + \alpha_3 \text{LLA}_{i,t} + \alpha_4 \text{LOANC}_{i,t} + \alpha_5 \text{LOAND}_{i,t} + \alpha_6 \text{LOANE}_{i,t} + \alpha_7 \text{LOANI}_{i,t} + \varepsilon_{i,t} \quad (6)$$

Following Cornett *et al.* (2006, 2009) and Beatty *et al.* (1995), panel data regression is applied using equation (6)-where LLP is the loan loss provision, natural log of total asset (LnTA), non-performing loan (NPL), loan loss allowances (LLAs), director's loan (LAOND), commercial and industrial loan (LOANI), loan to executives (LOANEs) and consumer loan (LOANC). All the variables are expressed as a percentage of total loans. Discretionary loan loss provisions (dllp) are the error term from this regression (equation 6). Discretionary loan loss provisions are calculated as:

$$\text{dllp} = \frac{(\varepsilon \times \text{Toatl Loan})}{\text{Total Asset}} \quad (7)$$

The relationship between the bank efficiency following corporate governance guidelines and EM is explored with another dynamic panel data regression analysis. An advantage of GMM method is that it could use lag of any variable. These lag variables are considered as endogenous variables (Hall and Alastair, 2005). For calculating the difference GMM estimates, Arellano-Bond (1991) first transforms all regressors by differencing or transforming in an orthogonal way that does not affect the sample size. The Arellano-Bover/Blundell-Bond estimator enhances the Arellano-Bond estimator with an additional assumption that instrumental variables with the first differences are uncorrelated with fixed effect and this assumption improves the efficiency of instruments. In this way, a system of two equations (the original equation and original equation with orthogonal transformation) is developed and it is known as System GMM. The empirical model under the study is:

$$y_{it} = y_{i,t-1} + \beta x_{it} + \gamma z_{it} + n_i + \varepsilon_i \tag{8}$$

where, "x", "y" and "z" represent the bank efficiency score, EM and firm characteristics, respectively, and "n_i" is the unobserved firm effect. The following equation is the first differencing, which entails eliminating the constant term and the individual effect under the dynamic model:

$$\Delta y_{it} = \Delta y_{i,t-1} + \beta \Delta x_{it} + \gamma \Delta z_{it} + n_i + \Delta \varepsilon_{it} \tag{9}$$

First differencing in a model helps eliminate the biasness that arises from unobserved heterogeneity and omitted variable which allows the uses of lagged values (past values) of all variables. The use of historical (past) values of explanatory variables is an important contribution of dynamic panel estimation (Wintoki *et al.*, 2012). Another aspect of using of lagged variables is that it must not correlate with the error term. This study uses a dynamic panel regression to determine the relationship between EM and bank efficiency. The model is specified as follows:

$$\text{dllp}_{it} = \alpha + \beta_i e_{it} + \varepsilon_{it} \tag{10}$$

Here, "dllp" is the discretionary accruals (i.e. measure of practice of EM), "e" donates the DEA/SFA generated efficiency scores for the private commercial banks in different years (and used as independent variable), "i" denotes individual bank, "t" denotes the time period and "β" is the unknown parameter to be estimated that captures the potential impact of efficiency on bank management's practice of EM.

3.4 Data collection and variable determination

The secondary data were collected from the library of DSE which were relied upon the audited published annual reports of private commercial banks. The study period span over the years 2007–2016 with 220 firm-year observations. For the study purposes, Islamic banks are excluded from the sample since the regulations in Islamic banking system are different. Among the thirty (30) listed private commercial banks, twenty-two (22) are selected based on conventional banking perspective. Only first, second and third generation listed PCBs are included here based on at least ten years of data availability. In case of Bangladesh, banking laws do not mention specific generations; however, in practice, PCBs are classified into four generations (first generation PCBs are from the year 1982 to year 1990; second generation PCBs are from year 1991–1998; third generation PCBs are from year 1999–2011 and PCBs established after year 2011 are said to be the fourth generation banks). Table 1 presents the definition of the variables used in the study. dllp is used as response variable (following Chang *et al.*, 2008; Curcio *et al.*, 2016).

Click here for Table 1: https://drive.google.com/file/d/1jYS2wGqC_8EnCzPcfEE2PtklGoQg83Xh/view

Table 2 shows the input and the output variables for DEA and SFA efficiency analysis. Two dimensions of corporate governance structure like board quality (percentage of independent director to total members of board of directors) and ownership concentration (percentage of ownership by the directors and institutions) are considered in this study.

Click here for Table 2: https://drive.google.com/file/d/1jYS2wGqC_8EnCzPcfEE2PtklGoQg83Xh/view

The higher the value of dllp, the higher the presence of earnings manipulations via loan loss provision. dllp is the error term derived from the regression equation (6). Here, only absolute value is considered ignoring the sign. The basic idea of the "Two-Step" approach was first given by Coelli (1996). In the two-step approach, efficiency scores are used as an input variable in linear regression model to explain the variation in the dependent variable. The DEA and SFA scores are deterministic, and the dllp is used as a regressor in panel data analysis specified in equation (10). Several other control variables are used in equation (10) and they include: stock return (StockRtn), GDP growth and bank size. GDPGr (growth rate of GDP) variable is used to address the economic fluctuation of the country and is expected to have a negative sign because banks are expected to reduce their provisions during the economic downturn (Ozili, 2017). LnTA (natural logarithm of total asset) is used because bank size and assets may differ. Banks with a large asset portfolio and high level of business activities usually maintain more provisions compared to small banks with low asset portfolios (Kilic *et al.*, 2014; Ozili, 2017).

4. Results and discussions

4.1 Efficiency scores based on corporate governance guidelines

In line with the Lehmann *et al.* (2004), Anouze (2010) and Al-Hussain (2009), this study evaluates the efficiency of bank based on corporate governance guidelines. The input oriented and output-oriented models provide the same values under the assumption of constant return to scale (CRS) assumption. The present study is based on CRS. Table 3 shows the DEA efficiency scores and SFA efficiency scores of sample PCBs over the period of 2007–2016. It can also be said that there are slacks in using the available resources to produce the same level of outputs efficiently. On average, the PCBs are using 80.84% of their resources and the level of inefficiency is 19.16% (1–0.8084).

Click here for Table 3: https://drive.google.com/file/d/1jYS2wGqC_8EnCzPcfEE2PtklGoQg83Xh/view

It is observed that there is not much differences in the efficiency estimates among the three methods. On an average, the efficiency lies within 80% in all cases. The average score of efficiency from DEA is lower than the score obtained from SFA. It is considered normal to have a lower score of efficiency in DEA because the scores estimated by DEA holds the non-negative technical inefficiency component, whereas SFA separates the non-negative components of inefficiency form random error terms (Bauer *et al.*, 1998; Robin *et al.*, 2017). However, the efficiency scores show great variation in case of SFA method when compared to DEA method. It is found in the current banking literature that the regression-based approach (SFA) can control the environmental condition as well as individual bank characteristics. It also provides more accurate efficiency estimates (Robin *et al.*, 2017). Hypothesis 1 is tested to show whether PCBs are efficient or not during the study period. PCBs of Bangladesh were found technically efficient. The results are found consistent with the study of Mahbub (2016), Al-Hussain (2009) and Lehman *et al.* (2004).

4.2 Relation between ranking and efficiency scores (DEA and SFA)

To analyze the rank similarity, the Spearman's rank correlation is conducted (Bauer *et al.*, 1998; Silva *et al.*, 2016). The results from the rank correlation are shown in Table 4 and it is evident from the this table that there is an insignificant positive correlation between the efficiency scores obtained from SFA and DEA approaches, and this result is in line with the findings of

Silva *et al.* (2016) and Mahbub (2016). From the results, it is obvious that there is no consistency among the PCBs rank in the case of Bangladesh and similar result is also documented by Mahbub (2016). According to Bauer *et al.* (1998), if the ranks of institution by two methods do not match, it may create problems for policymakers to determine which methods to rely on for determining whether banks are efficient or not. Considering the Hypothesis 2 and 3, efficiency scores under different methods (DEA and SFA) provide the same distribution pattern and have the correlation among them. The results are also found consistent with previous studies like Bauer *et al.* (1998), Silva *et al.* (2016), Mahbub (2016) and Robin *et al.* (2017).

Click here for Table 4: https://drive.google.com/file/d/1jYS2wGqC_8EnCzPcfEE2PtklGoQg83Xh/view

4.3 Relationship between bank efficiency and earnings management

The relationship between bank efficiency based on corporate governance and earnings management is determined through empirical studies. The methods are pooled OLS and dynamic panel estimation. GMM differences (Arellano and Bond, 1991) and GMM system (Blundell and Bond, 1998) are used for estimating the relationship between these two variables. dllp is used as a proxy for EM. dllp is calculated from the error term in the previous section. Efficiency score is generated (technical efficiency) from DEA method and SFA method.

Breusch-Pagan (Cook–Weisberg) test for detecting heteroskedasticity is conducted and is presented in Table 5. If the chi-squared value is significant with p-value below 5% level of significance (e.g. $p < 0.05$) then the null hypothesis of homoskedasticity is rejected and heteroskedasticity assumed. Based on the result, it is evident that there is heteroskedasticity in the data set.

Click here for Table 5: https://drive.google.com/file/d/1jYS2wGqC_8EnCzPcfEE2PtklGoQg83Xh/view

Table 6 shows the results obtained from the GMM estimation in determining the relationship between the corporate governance efficiency score derived from technical efficiency of DEA method and practice of earnings management. The AR (1) test indicates that the residuals in first differences are correlated as expected. Arellano-Bond second order correlation (AR 2) is found asymptotically distributed under null hypothesis of no serial correlation. The AR (2) test gives the p-values above 10% level of significance and thereby do not reject the null hypothesis of second order serial correlation. The Sargan test of over-identifying restrictions examines whether the instruments are group-wise exogenous or not. Insignificant p-values is expected, but the Sargan test is only appropriate with a difference GMM estimator with the assumption of homoscedasticity and no serial correlation of the idiosyncratic error term. With the two-step system GMM estimates, it is highly recommended to consider the application of Hensen test (Roodman, 2009; Alami, 2015). Hensen test of over-identifying restrictions allows for the acceptance of validity of the instruments. The value reported in Diff-in-Hensen test are the p-values for the validity of the additional moment restrictions necessary for GMM system. As the null hypothesis is not rejected, it is evident that the additional moment conditions are valid. All the results of the system GMM are found to be valid (Table 6).

Click here for Table 6: https://drive.google.com/file/d/1jYS2wGqC_8EnCzPcfEE2PtklGoQg83Xh/view

The relation between EM and efficiency score in both cases of two-step system GMM and difference GMM are found to be negative. The negative coefficients (−0.7969 and −0.57) indicate that as the efficiency increases, the practice of earnings management by the PCBs reduces. Similar results are also exhibited when other control variables (growth of loan, size of the bank and GDP growth rate) are added in the model. The negative coefficient indicates that the practice of EM and efficiency of bank are not influenced by the asset growth, bank size or economic conditions. However, the stock return is found to be positive (0.0015) in both cases with the two-step system and difference GMM. Empirical results of the study also establish

the fact that the more efficient the management of the bank is, the less likely it will practice EM under the compliance of corporate governance guidelines. Based on the findings posited, hypothesis 4 is strongly supported.

4.4 Robustness check

Table 7 shows the results of the GMM estimation in determining the relationship between the corporate governance efficiency score derived from SFA method technical efficiency and the practice of EM. The AR (1) test indicates the residuals in first differences are correlated as expected. The AR (2) test gives the *p*-values above 10%. As the null hypothesis is accepted, it can be said that there is presence of second order serial correlation. It is clear from Table 7 that efficient banks following corporate governance structure are less likely to practice EM in the case of Bangladesh. All the results of the system GMM are found to be valid as evidenced from the Sargan test and Hensen test. The negative coefficient for efficiency score (−1.473 and −0.363) indicate that as the efficiency increases, the practice of earnings management by PCBs reduces in both two-step system GMM and difference GMM.

Click here for Table 7: https://drive.google.com/file/d/1jYS2wGqC_8EnCzPcfEE2PtklGoQg83Xh/view

5. Conclusion

This research paper combines two concepts – efficiency measurement and practice of EM. This study is conducted to know the relationship between bank efficiency in terms of corporate governance guidelines and the extent of practice of earnings management. Based on data availability and corporate governance guidelines, only the data of listed private commercial banks (PCBs) are used for study purposes for the period of 2007–2016. This study uses the dynamic panel data approach of Arellano and Bond (1991) and Blundell and Bond (1998) to address the problem of potential endogeneity and heteroskedasticity on the model (Rahman *et al.*, 2018). The empirical study found that efficient banks complying with corporate governance guidelines are less likely to practice earnings management. Moreover, it is found that as the efficiency increases, the practice of earnings management reduces. Both two-step system GMM and difference GMM provide consistent results. Results from the DEA scores are compared with the efficiency scores obtained under SFA to check the robustness of the estimated results and we get identical results in each of the method. Based on the results, it has been deduced that the more efficient is the management of the PCBs in terms of complying with corporate guidelines, the less it will practice earnings management.

5.1 Theatrical and practical implication

It is well documented in several studies that agency theory has a dominant role in corporate governance studies (Jensen and Meckling, 1976; Almasarah, 2015) and it is required to maintain an adequate monitoring mechanism for the protection of rights of shareholders. Existing literatures suggest that the effectiveness of corporate governance aligns with decreasing agency conflict, protection of shareholders' interests and restrains management from self-serving activities (i.e. practice of earnings management).The empirical results of the study established the fact that the more efficient the management of the bank is, the less likely it will practice EM under the compliance of corporate governance guidelines. This study is also helpful to understand how competitions and peers in this industry become more efficient and how far each bank is from the benchmark firms. This study may help to assess the managerial capacity in terms of ensuring safety and soundness of the bank. Our findings are also important for policymakers for implementation of good governance. Ensuring governance in banks is important because of banking industry plays a very crucial role in

any economy and in any society. By aligning corporate governance and establishing control mechanism, effective corporate governance represent a key point for supervisors, emphasizing the need for appropriate levels of checks and balances at each bank level. The results from this study are also important for regulators and bank management while drafting new strategies, regulatory changes and reforms by examining the efficiency drivers for the banking industry.

The banking industry in Bangladesh suffers from EM due to influential board structure, family legacy, presence of political members and presence of influential bureaucratic members in any board structure. Despite the existence of several guidelines regarding compliance issues, those are hardly followed. The fragile legal system, inadequate monitoring mechanism and presence of beneficiary groups may motivate management to engage in earnings management more frequently. Incorporation of good governance may not be possible because of these beneficiary groups. Nothing could happen and no solution could be made in the absence of ethical considerations of management and owners of the banking industry. Corruption needs to be strongly mitigated for successful functioning of the banking industry. It can be said that the key to more efficient bank and banking industry lies with the inter-linkage and interactions among banking system, supervisory mechanism and economic policies of a country.

5.2 Limitation of the study and future research direction

This research study has some limitations. Only conventional banks are considered for the study, except for Islamic banks. Second, when measuring the efficiency of private commercial banks, only the ownership structure and board quality are considered as corporate governance variables. Comparison beyond these variables could have been done; this gives the future scope for further research.

References

Ab-Hamid, M.F., Asid, R., Sulaiman, N.F., Sulaiman, W.F.W. and Abdul, N.E. (2018), "The effect of earnings management on bank efficiency", *Asian Journal of Accounting and Governance*, Vol. 10, pp. 73-82, available at: https://www.econbiz.de/Record/the-effect-of-earnings-management-on-bank-efficiency-mohd-fahmee-hamid/10012052975.

Ahmed, M.S. and Liza, F.F. (2013), "Efficiency of commercial banks in Bangladesh – a data envelopment analysis", *European Journal of Economics, Finance and Administrative Science*, Vol. 56, pp. 130-152, available at: https://www.researchgate.net/publication/281821597_Efficiency_of_Commercial_Banks_in_Bangladesh-a_Data_Envelopment_Analysis.

Al-Hussain, A. (2009), "Relationship between corporate governance efficiency and Saudi bank's performance", *The Business Review*, Vol. 14 No. 1, pp. 111-117, available at: https://www.researchgate.net/publication/256004302_Relationship_between_Corporate_Governance_Efficiency_and_Saudi_Banks'_Performance.

Alimi, R.S. (2015), "Financial deepening and economic growth: a system GMM panel analysis with application to 7SSA countries", available at: http://mpra-ub.uni-muenchen.de/65789/MRPA No.65789.

Almasarwah, A. (2015), "Earnings management and its relationship with corporate governance mechanism in Jordanian industrial firms", A Doctoral Thesis, Submitted in, Loughborough University, available at: https://dspace.lboro.ac.uk/2134/20565.

Anandarajan, A., Hasan, I. and Lozano-Vivas, A. (2003), "The role of loan loss provisions in earnings management, capital management, and signaling: the Spanish experience", *Advances in International Accounting*, Vol. 16, pp. 45-66, available at: https://www.sciencedirect.com/science/article/abs/pii/S0897366003160035.

Anandarajan, A., Hasan, I. and McCarthy, C. (2007), "Use of loan loss provisions for capital, earnings management and signalling by Australian banks", *Accounting and Finance*, Vol. 47 No. 3, pp. 357-379, available at: https://econpapers.repec.org/article/blaacctfi/v_3a47_3ay_3a2007_3ai_3a3_3ap_3a357-379.htm.

Andres, P.D. and Vallelado, E. (2008), "Corporate governance in banking: the role of the board of directors", *Journal of Banking and Finance*, Vol. 32, pp. 2570-2580, available at: https://econpapers.repec.org/article/eeejbfina/v_3a32_3ay_3a2008_3ai_3a12_3ap_3a2570-2580.htm.

Anouze, A.L. (2010), "Evaluating productive efficiency: a comparative study of commercial banks in gulf countries", Unpublished PhD thesis, Aston Business School, Aston University, available at: http://publications.aston.ac.uk/id/eprint/16433/1/Evaluating+productive+efficiency(2010).pdf.

Arellano, M. and Bond, S. (1991), "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations", *The Review of Economic Studies*, Vol. 58 No. 2, pp. 277-295, available at: https://www.jstor.org/stable/2297968?seq=1.

Bauer, P.W., Berger, A.N., Ferrier, G.D. and Humphery, D.B. (1998), "Consistency conditions for regulatory analysis of financial institution: a comparison of frontier efficiency methods", *Journal of Economics and Business*, Vol. 50, pp. 85-114, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=137992.

Beatty, A., Chamberlain, S. and Magliolo, J. (1995), "Managing financial reports of commercial banks: the influence of taxes, regulatory capital and earnings", *Journal of Accounting Research*, Vol. 33 No. 2, pp. 231-261, available at: https://www.jstor.org/stable/2491487?seq=1.

Berger, A.N., Hasan, I. and Zhou, M. (2009), "Bank ownership and efficiency in China: what will happen in the world's largest nation?", *Journal of Banking and Finance*, Vol. 33, pp. 113-130, available at: https://www.sciencedirect.com/science/article/abs/pii/S0378426607003822.

Berger, A.N., Kick, T. and Schaeck, K. (2012), "Executive board composition and bank risk taking", Discussion Paper Deutsche Bundesbank, No. 03, pp. 1-80, available at: https://ideas.repec.org/p/zbw/bubdps/032012.html.

Biswas, P.K. (2012), "Corporate governance in Bangladesh: some observations", *The Cost and Management*, July–August 2012, 5–9, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2271156.

Blundell, R. and Bond, S. (1998), "Initial conditions and moment restrictions in dynamic panel data models", *Journal of Econometrics*, Vol. 87, pp. 115-143, available at: https://www.ucl.ac.uk/~uctp39a/Blundell-Bond-1998.pdf.

Boucinha, M., Ribeiro, N. and Weyman-Jones, T. (2013), "An assessment of Portuguese banks' efficiency and productivity towards Euro area participation", *Journal of Productivity Analysis*, Vol. 39, pp. 177-190, available at: https://ideas.repec.org/a/kap/jproda/v39y2013i2p177-190.html.

Charnes, A., Cooper, W.W. and Rhodes, E. (1978), "Measuring the efficiency of decision making units", *European Journal of Operational Research*, Vol. 2, pp. 429-444.

Chang, R.D., Shen, W.H. and Fang, C.J. (2008), "Discretionary loan loss provision and earnings management for the banking industry", *International Business and Economic Research Journal*, Vol. 7 No. 3, pp. 9-20, available at: https://www.researchgate.net/publication/297678098_Discretionary_Loan_Loss_Provisions_And_Earnings_Management_For_The_Banking_Industry.

Coelli, T.J. (1996), "A guide to DEAP version: a data envelopment analysis (computer) program", Working Papers 96/08, Centre for Efficiency and Productivity Analysis, Department of Econometrics, University of New England, Armidale, available at: http://www.owlnet.rice.edu/~econ380/DEAP.PDF.

Coelli, T., Rao, D.S.P., Donnel, C.J.O. and Battese, G.E. (2005), *An Introduction to Efficiency and Productivity Analysis*, 2nd ed., Springer, New York, NY.

Cornett, M.M., Marcus, A.J., Saunders, A. and Tehranian, H. (2006), "Earning management, corporate governance and true financial performance", Working paper, Boston College, available at:

https://www.semanticscholar.org/paper/Earnings-Management%2C-Corporate-Governance%2C-and-True-Tehranian-Cornett/c46919c51f276f4ef703591896711d0413c85d03.

Cornett, M.M., Marcus, A.J., Saunders, A. and Tehranian, H. (2009), "Corporate governance and earnings management at large US bank holding companies", *Journal of Corporate Finance*, No. 15, pp. 412-430.

Curcio, E., Simone, A.D. and Gallo, A. (2016), "Financial crisis and international supervision: new evidence on the discretionary use of loan loss provisions at Euro Area commercial banks", *The British Accounting Review*, pp. 1-13, available at: https://1library.net/document/7qv8d5lz-financial-crisis-international-supervision-evidence-discretionary-provisions-commercial.html.

Farraz, L., Fernandez, H. and Louvel, P. (2011), "Um indice de avaliaco da qualidade da governance corporative no Brazil", *Revista Contabilidade and Finanance*, Vol. 22 No. 55, pp. 45-63, available at: https://www.scielo.br/scielo.php?script=sci_arttext&pid=S1519-70772011000100004.

Francis, B., Hasan, I. and Li, L. (2016), "Evidence for the existence of downward real-activity earnings management", *Journal of Accounting, Auditing and Finance*, Vol. 31 No. 2, pp. 212-248, doi: 10.1177/0148558X15582086?journalCode=jafa.

Hall and Alastair, R. (2005), *Generalized Method of Moments, Advanced Texts in Econometrics*, Oxford University Press.

Jensen, M.C. and Meckling, W.J. (1976), "Theory of the firm: managerial behavior, agency costs, and ownership structure", *Journal of Financial Economics*, Vol. 3 No. 4, pp. 305-360, available at: https://www.sciencedirect.com/science/article/pii/0304405X7690026X.

Kanagaretnam, K., Lobo, G.J. and Mathieu, R. (2010), "Managerial incentives for income smoothing through bank loan loss provisions", *Review of Quantitative Finance and Accounting*, Vol. 20, pp. 63-80, doi: 10.1023/A:1022187622780.

Karimzadeh, M. (2012), "Efficiency analysis by using data envelopment analysis model: evidence from Indian banks", *International Journal of Latest Trends Finance, Economics and Science*, Vol. 2 No. 3, pp. 228-237, available at: https://www.academia.edu/2246078/Efficiency_analysis_by_using_Data_Envelopment_Analysis_model_evidence_from_Indian_banks.

Kilic, E.O., Acar, G. and Coskun, A. (2014), "Detecting earnings management practices in banks: evidence from Turkey", *European Journal of Economic and Political Studies*, Vol. 7, pp. 21-36, available at: https://www.researchgate.net/publication/328739248_Detecting_Earnings_Management_Practices_in_Banks_Evidence_from_Turkey.

Kuchler, A. (2013), "The efficiency of Danish Banks before and during the crisis: a comparison of DEA and SFA", *Denmark National Bank Working Paper Series*, Vol. 87, pp. 1-29, available at: https://www.nationalbanken.dk/en/publications/Pages/2013/12/A-comparison-of-DEA-and-SFA.aspx.

Kumbhakar, S.C. and Lozano-Vivas, A. (2005), "Deregulation and productivity: the case of Spanish banks", *Journal of Regulatory Economics*, Vol. 27, pp. 331-351, doi: 10.1007/s11149-005-6627-2.

Kusuma, H. and Ayumardani, A. (2016), "The corporate governance efficiency and Islamic banks performance on Indonesian evidence", *Polish Journal of Management Studies*, Vol. 13 No. 1, pp. 111-120, available at: https://ideas.repec.org/a/pcz/journl/v13y2016i1p111-120.html.

Lehmann, E., Warning, S. and Weigand, J. (2004), "Governance structure, multidimensional efficiency and firm profitability", *Journal of Management and Governance*, Vol. 8, pp. 279-304, available at: https://link.springer.com/article/10.1007/s10997-013-9271-8?shared-article-renderer.

Leventis, S., Dimitropoulos, P. and andAnandarajan, A. (2010), "Loan loss provisions, earnings management and capital management under IFRS: the case of EU commercial banks", *Journal of Financial Services Research*, Vol. 40, pp. 103-122, doi 10.1007/s10693-010-0096-1.

Lin, X. and Zhang, Y. (2009), "Bank ownership reform and bank performance in China", *Journal of Banking and Finance*, Vol. 33, pp. 20-29, available at: https://ideas.repec.org/a/eee/jbfina/v33y2009i1p20-29.html.

Mahbub, T. (2016), "The performance of Bangladeshi commercial banks: the role of corporate governance", A thesis submitted to fulfillment of Degree of Doctor of Philosophy, University of Manchester, available at: https://www.research.manchester.ac.uk/portal/en/theses/the-performance-of-bangladeshi-commercial-banksthe-role-of-corporate-governance(8fcbba3e-7b37-470e-92e7-1a905718ab15).html.

Makhaiel, N. and Sherer, M. (2017), "In the name of others: an investigation of the earnings management motives in Egypt", *Journal of Accounting in Emerging Economics*, Vol. 7 No. 1, pp. 61-89, available at: https://www.deepdyve.com/lp/emerald-publishing/in-the-name-of-others-an-investigation-of-earnings-management-motives-39jKweJEyQ.

Mester, L.J. (1997), "Measuring efficiency of U.S. banks: accounting for heterogeneity is important", *European Journal of Operational Research*, Vol. 98, pp. 230-242.

Mollah, S. and Zaman, M. (2015), "Shri'ah supervision, corporate governance and performance: conventional vs. Islamic banks", *Journal of Banking and Finance*, Vol. 58, pp. 418-435, available at: https://hull-repository.worktribe.com/output/445561/shariah-supervision-corporate-governance-and-performance-conventional-vs-islamic-banks.

Nguyen, T.P.T., Nghiem, S.H., Roca, E. and Sharma, P. (2016), "Bank reforms and efficiency in Vietnamese banks: evidence based on SFA and DEA", *Applied Economics*, Vol. 48 No. 30, pp. 2822-2835, doi: 10.1080/00036846.2015.1130788.

Ozili, P.K. (2017), "Discretionary provisioning practices among Western European banks", *Journal of financial Economic Policy*, Vol. 9 No. 1, pp. 1-12, doi: 10.1108/JFEP-07-2016-0049.

Rahman, M.M., Zheng, C., Ashraf, B.N. and Rahman, M.M. (2018), "Capital requirements, the cost of financial intermediation and bank risk-taking: Empirical evidence from Bangladesh", *Research in International Business and Finance*, Vol. 44, pp. 488-503, available at: https://ideas.repec.org/a/eee/riibaf/v44y2018icp488-503.html.

Razzaque, R.M.R., Ali, M.J. and Mather, P.R. (2016), "Real earnings management in family firms: evidence from an emerging economy", *Pacific-Basin Finance Journal*, Vol. 40, pp. 237-450, available at: https://www.sciencedirect.com/science/article/pii/S0927538X15300275.

Robin, I., Salim, R. and Bolch, H. (2017), "Cost efficiency in Bangladesh baking: does financial reform matter?", *Journal of Applied Economics*, Vol. 50 No. 8, pp. 891-904, doi: 10.1080/00036846.2017.1346361.

Roodman (2009), "How to do xtabond2: an introduction to difference and system GMM in Stata", *STATA Journal*, Vol. 9 No. 1, pp. 86-168, doi: 10.1177/1536867X0900900106.

Salim, R., Arjomandi, A. and Seufert, J. (2016), "Does corporate governance affect Australian banks' performance?", *Journal of International Financial Markets, Institutions and Money*, Vol. 43, pp. 113-125, available at: https://www.sciencedirect.com/science/article/abs/pii/S1042443116300336.

Sanchez, J. and Meca, E. (2005), "Audi qualifications and corporate governance in Spanish listed firms", *Managerial Auditing Journal*, Vol. 20 No. 7, pp. 725-738, available at: https://www.researchgate.net/publication/243464434_Audit_Qualifications_and_Corporate_Governance_in_Spanish_Listed_Firms.

Schipper, K. (1989), "Commentary on earnings management", *Accounting Horizons*, Vol. 3, pp. 91-102, available at: https://www.semanticscholar.org/paper/Commentary-on-earnings-managementSchipper/38e22e38be93bacea38681d400abf70f3adb679a.

Sheldon, G (1994), "Economies, inefficiencies and technical progress in Swiss banking", in Fair, D.E. and Raymond, R. (Eds), *The Competitiveness of Financial Institutions and Centers in Europe, Financial and Monetary Policy Studies*, Springer, Dordrecht, Vol. 28, doi: 10.1007/978-94-015-8350-3_8.

Silva, T.C., Tabak, B.M., Cajueiro, D.O. and Dias, V.B. (2016), "A comparison of DEA and SFA using micro and macro level perspectives: efficiency of Chinese local banks", *Physica A: Statistical Mechanics and its Application*, Vol. 496 No. c, pp. 216-223, doi: 10.1016/j.physa.2016.11041.

Uddin, S.M.S. and Suzuki, Y. (2011), "Financial reform, ownership and performance in banking industry: the case of Bangladesh", *International Journal of Business and Management*, Vol. 6

No. 7, pp. 28-39, available at: http://www.ccsenet.org/journal/index.php/ijbm/article/view/8759.

Wang, D. and Kumbhakar, S.C. (2009), "Strategic groups and heterogeneous technologies: an application to the US banking industry", *Macroeconomics and Finance in Emerging Market Economics*, Vol. 2, pp. 31-57, doi: 10.1080/17520840902726268.

Wei, G. (2007), "Ownership structure, corporate governance and company performance in China", *Asia Pacific Business Review*, Vol. 13 No. 4, pp. 519-545, available at: https://www.researchgate.net/publication/232928955_Ownership_Structure_Corporate_Governance_and_Company_Performance_in_China.

Wintoki, M.B., Linck, J.S. and Netter, M.J. (2012), "Endogeneity and the dynamics of internal corporate governance", *Journal of Financial Economics*, Vol. 105 No. 3, pp. 581-606, available at: https://econpapers.repec.org/article/eeejfinec/v_3a105_3ay_3a2012_3ai_3a3_3ap_3a581-606.htm.

Yasmeen, W. (2011), "Technical efficiency in the Bangladeshi banking industry: a non parametric analysis", *The 2011 Barcelona European Academic Conference*, available at: http://conferences.cluteonline.com/index.php/IAC/2011SP/paper/viewFile/562/569.

Zeineb, G.B. and Mensi, S. (2018), "Corporate governance, risk and efficiency: evidence from GCC Islamic banks", *Managerial Finance*, Vol. 44 No. 5, pp. 551-569, doi: 10.1108/MF-05-2017-0186/full/html.

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