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How do Islamic banks manage earnings? Application of various measurement models in the Iranian Islamic banking system

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Abstract

Purpose – This study aims to identify and compare the measurement models of earnings management (EM) appropriate to the Iranian Islamic banking system. The importance of reported profit figures has motivated business executives, who also perform financial reporting, to manipulate these figures. These measures are referred to as "earnings management," which negatively influence the quality of reported earnings and financial statements' reliability.

Design/methodology/approach – In this study, four methods, namely, Jones (1991), modified Jones (Dechow *et al.*, 1995), Kasznik (1999) and Kothari *et al.* (2005), were used to measure the EM index in 25 Iranian Islamic banks (IBs) registered with the Tehran Stock Exchange and/or the Central Bank of Iran. The study covered the period 2005–2020. Following the aforementioned methods, this research implemented templates that were repeatedly tested in subsequent studies using accruals to discover EM.

Findings – The results show that the Kasznik (1999) model is the preferred and compatible model with the Iranian Islamic banking system's accrual behaviour due to the consistency of the measurement coefficients with theoretical and previous research findings. Therefore, total accruals, including discretionary accruals and non-discretionary accruals, have the most correspondence with (1) property, machinery and equipment; (2) the change in cash flow from operating activities; and (3) the difference of change in revenue (ΔREV) and change in net receivable accounts (ΔREC).

Originality/value – This is the first investigation in the Iranian Islamic banking system. The research contributes to the Iranian Islamic banking system literature on the implements of EM, which could be appealed to in the context of developing countries like Iran. Finally, this study highlights the different EM capabilities in Islamic banking systems similar to the Iranian banking arrangement.

Keywords Accounting earnings, Accruals, Earnings management, Iranian Islamic banking system

Paper type Research paper

Introduction

Accounting earnings represent one of the essential components of financial statements that have always been considered and used as a criterion for evaluating the continuity of activity, efficiency, revision of the structure of earning contracts and predicting future cash flows for investors. Investors and stakeholders pay particular attention to reported earnings, and in most cases, these components are used as a critical criterion in their decisions (Govahi *et al.*, 2013). Accounting earnings consist of two parts: the cash component, which entails the cash flow over a period, and the accruals. In performance evaluation, earnings accrual is more

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important than cash earnings. That is why the differences between accounting earnings and actual earnings relate to accrual earnings because managers can manipulate a company's earnings using accruals and produce accounting earnings that differ from real profits (Abbaszadeh and Arefiasl, 2015).

Head managers have encouraged business managers to manipulate accounting earnings, as the interests of managers may conflict with those of owners. Doing so enables managers to achieve financial analyst forecasts and meet market expectations (Govahi *et al.*, 2013).

A bank can link suppliers and demanders of cash to achieve its business earnings like any other business. Such earnings should be shared among the beneficiaries – first, depositors and then owners or bank shareholders – just as conventional banks often distribute their earnings to shareholders and depositors.

Like managers in other industries, bank managers have incentives to conduct "earnings adjustment" and maximise their banks' or managers' wealth. The difference is only in methods used to employ earnings management (EM) tools. As the banking industry is highly regulated and controlled, EM is a less likely tool. Following the banking collapse and crisis in 2008, however, concern over EM in banks attracted widespread attention (Wan Mohammad *et al.*, 2011).

Unlike managers in other industries, bank managers often use the losses of non-performing loans (NPLs) to make an impact on reported earnings. Collins *et al.* (1995) analysed the impact of adjusting capital, earnings and taxation on some banks' capital increase decisions. The study results expected that low levels of current non-discretionary earnings encouraged managers to identify incoming investments corresponding with decreasing loan losses and concluded a significant association between the identified earnings and NPLs. Shrieves and Dahl (2003) indicated that bank managers intend to use short-term earnings or losses due to NPLs to smoothen earnings (Chang *et al.*, 2008).

For example, the explanatory notes attached to the Bank's Performance Report indicated that in preparing financial statements, the bank's management has used judgements, measurements, and assumptions to determine the identified figures in the financial statements. Actual results may differ from measurements. These measurements and assumptions, which are based on past bank records, are continually reviewed by a manager in the light of actual events. The key areas in which managers use judgements and measurements are as follows:

(1) Calculating bad debt allowances in different accounts in different banks by examining the customer's status and the industry it is involved in, taking legal action, investigating file guarantors and estimating the amount of reliance on guarantors in the receivables collection process.

(2) Determining control over investees.

EM is important because measures are instrumental in the banking industry, including credit ratings, capital adequacy, and reserves estimation. A small percentage change in estimates, costs or revenues can severely affect the financial position of a bank. Many of the costs or estimated revenues affect the profit and loss accruals and the balance sheet's stock and flow results. These considerations are taken into account in the estimation of earnings, based on the categorisation of EM mentioned in Nouri *et al.* (2013).

The present study seeks to answer the following question: Which of the following measurement models is the profit management approach most compatible with the Islamic banking system in Iran: Jones (1991), modified Jones (Dechow *et al.*, 1995), Kasznik (1999) or Kothari *et al.* (2005)? Specifically, this study aims to investigate the potential role of analytical monotheism, as epitomised by the Islamic concept of *tawḥīd* (the oneness of Allah), in creating any difference in the performance and conduct of Islamic banks (IBs).

The remainder of this study is arranged as follows: the next section discusses the literature review; the methodological framework of the research is described thereafter; the data and conceptual model are then presented; it is followed by the findings section; lastly, the concluding remarks are delineated.

Literature review

After the financial scandals in some of the largest corporations of the world, investor confidence in the corporate financial reporting system declined, and the concept of earnings was considered an essential factor in determining the credit and reliability of reported figures in financial statements (Abbaszadeh and Arefiasl, 2015). Lo (2008) believes that EM is connected with low revenue quality and examines the relationship between EM and revenue quality. The results of this research emphasised that EM has a significant inverse relationship with revenue quality, which means that companies that use EM have lower revenue quality and vice versa (Arabmazar-Yazdi and Karani, 2011).

According to the initial attempts, Jensen and Meckling (1976) introduced the principal–agent problem and defined corporate managers as "agents" and shareholders as "principals". In their analysis, a shareholder is in contrast to a manager. In other words, decision-making is delegated to managers, but this can be problematic, as agents do not necessarily make decisions for the benefit of principals. One of the agency theory's main assumptions is that "principals" and "agents" have conflicting interests. In their view, the management's incentives for personal gain can be at odds with the goal of maximising shareholder wealth. Given their freedom to use accounting procedures, managers seek to be aware of how accounting procedures affect their wealth and use these procedures for their own benefit. Increasing the wealth of managers can be associated with lowering the wealth of other groups, including shareholders.

In other words, the separation of ownership from management in stock companies has made it possible for managers to transfer at least part of the wealth of intra-organisational groups. First, managers have access to information that other people will not have access to, at least in part. Second, because it is the function of managers to provide and submit information, including financial information, it has been possible for them to change the information for their benefit (Asadi and Mennati-Monjogh'tapeh, 2011). For example, they may raise the end-of-period inventories (which would transfer part of the fixed overhead to the next period), offer special discounts at the end of the year to raise sales revenue, or make formal exchanges among investment companies to identify the incremental return on investment value (Nikoumaram *et al.*, 2009). Reporting unrealised revenue in subsequent years in the current financial year could lead to a reward for the manager and guarantee management survival, putting the ownership of unrealised revenue at risk.

Following the above-mentioned background of EM in the literature, some researchers investigated the relationship between EM, stock risk and future profitability as well as the efficiency or opportunism of EM practice in Iranian selected companies (Bahar-Moghaddam and Kohi, 2012; Nouri *et al.*, 2013; Govahi *et al.*, 2013). Bahar-Moghaddam and Kohi (2012), using voluntary accruals as the variables for management calculations, examined different profit management calculation models and found Kasznik (1999) to be the best-fitted model. Govahi *et al.* (2013) also tested various proposed models in their research and, likewise, determined the Kasznik (1999) model to be the one with the highest accuracy among five different models.

Different studies have examined different types of EM measurement in banks. Jan-Ali-Zadeh (2016) specifically used the modified Jones (Dechow *et al.*, 1995) model to measure EM and examine the interaction of EM and banks' social responsibility. This is in line with the approach of Nouri *et al.* (2013), which used the accruals method and the modified Jones model

(Dechow *et al.*, 1995) in the banking system to evaluate the EM index, and concluded that the modified Jones model is an appropriate approach for EM evaluation in the Iranian banking system.

Several banking system-related studies, such as that of Kato *et al.* (2001), have compared different models of EM measurement of banks, such as the model of Healy and Wahlen (1999) and that of Ahmed *et al.* (1999), to detect the existence of EM and examine the effect of government policymaking on minimum dividend yields in banks. Moreover, Yasuda *et al.* (2004) studied the most challenging period for the Japanese banking industry, 1990 to 1999, to inspect the bank risk-voluntary accruals relationship using the modified Jones model (Dechow *et al.*, 1995). Wan Mohammad *et al.* (2011) studied a sample of 10 Malaysian banks for an approximately 10-year period from 2000 to 2009 after calculating voluntary accruals using the modified Jones model (Dechow *et al.*, 1995) as an indicator of EM. They examined the impact of EM on the cost variables of doubtful receivables, dividends and bank risk. Abdelsalam *et al.* (2016) compared IBs operating within the framework of strict religious rules and restrictions on expanding their accounts and ethical accountability with their traditional counterparts (conventional banks). According to their findings, religious norms and moral responsibility in these IBs have positive implications for the quality of financial reporting and organisational costs. They utilised the same modified Jones model (Dechow *et al.*, 1995) that Yasuda *et al.* (2004) had employed, using the banking system to measure the EM index in the Middle East and North Africa region.

In another strand of banking-related research, Amidu and Kuipo (2015) investigated the implications of EM for funding and diversification strategies of 330 banks in 29 African countries over the period 2002–2009. They found that most of the sampled banks manage their earnings, but both bank occupations mix and funding conventions could explain bank earnings features. Overall results indicate that EM's responsiveness to revenue diversification over interest benefits diminishes as bank market penetration rises. Besides, Barghathi *et al.* (2017) discussed EM's problem and investigated various stakeholders' opinions about the financial reporting standard of Libyan commercial banks (LCBs). The paper reports on 28 semi-structured interviews among numerous stakeholders in LCBs. Results imply that some controversy and misunderstanding exists about the meaning of the words "income control". In a similar research, Talab *et al.* (2017) used the *M*-score model to discover the EM practice in companies listed on the Iraqi stock exchange. The result indicates that EM activities exist for most of the banks listed on the Iraqi stock exchange. The researchers suggest that professionals should be more competent by following international audit quality criteria to minimise EM procedures.

Moreover, Vania *et al.* (2018) found that EM in Islamic commercial banks in Indonesia and Malaysia varies greatly. Finally, Meisel (2013) expanded on EM research by empirically evaluating the potential of an industry-specific design to recognise EM in the world of financial institutions, especially merged banks. The paper used the modified Jones (Dechow *et al.*, 1995) specification and found that merged banks raise earnings to represent more massive shareholder returns and often tend to change assets (loans) in order to lower capital ratios and improve reported efficiency.

It is noticeable that although the review of the literature on EM research reveals four specific models – namely Jones (1991), modified Jones (Dechow *et al.*, 1995), Kasznik (1999) and Kothari *et al.* (2005) – that have a considerable share in measuring EM levels in this area, there is a significant research gap for studies that focus on IBs which consider the panel data approach, especially in the case of the Iranian Islamic banking system. Therefore, this paper aims to study the compatibility of the aforementioned models with the banking system's performance in Iran and introduces the most consistent and preferred model for use in future research in the field of EM in the Iranian banking system.

Methodology

Studies involving EM in countries other than Iran include those performed by DeFond and Jiambalvo (1994), Subramanyam (1996), Kasznik (1999), Bartov *et al.* (2000), Hribar and Collins (2002), Yasuda *et al.* (2004), Wan Mohammad *et al.* (2011). Iranian studies by Mahmoud-Abadi and Mansouri (2011), and Nouri *et al.* (2013) have defined accruals as the difference in earnings and cash flow operations, as follows:

$$ACC_{it} = EBIT_{it} - CFO_{it}$$
$$\text{Accruals} = \text{Earnings Before Interest and Taxes} - \text{Net Cash Flow Operations} \quad (1)$$

Various models are employed to segregate the discretionary part of the entire accruals. In this research, the four models of Jones (1991), modified Jones (Dechow *et al.*, 1995), Kasznik (1999) and Kothari *et al.* (2005) are considered.

Jones (1991) model

In the first step, this model estimates ACC_{it} of the accruals relationship (given in Equation 1) for a given period, known as the estimation period, with the revenue and property, plant and equipment variables in the following equation:

$$ACC_{it} = \alpha_0 + \alpha_1 \Delta REV_{it} + \alpha_2 PPE_{it} + \varepsilon_{it} \quad (2)$$

where

ACC: Total accruals (discretionary accruals + non-discretionary accruals)

ΔREV: Change in revenue

PPE: Gross property, plant and equipment

ε: Residual component (discretionary accrual index)

In the second step, called the event period, the Jones model estimates the amount of discretionary accruals (DA) used for each year of the sampled business firms, using the coefficients estimated in the first step for each company, as shown in Equation (3):

$$DA_{it} = ACC_{it} - NDA_{it} = ACC_{it} - \hat{\alpha}_0 - \hat{\alpha}_1 \Delta REV_{it} - \hat{\alpha}_2 PPE_{it} \quad (3)$$

In this equation, the DA variable represents the discretionary accruals and is equal to ε_{it} and the EM index. Also, NDA represents the non-discretionary accruals.

Modified Jones (Dechow et al., 1995) model

In this model, ΔREC is the change in net receivable accounts, and other variables are similar to what was previously defined. The modified Jones model is defined in Equation (4) as follows:

$$ACC_{it} = \alpha_0 + \alpha_1(\Delta REV_{it} - \Delta REC_{it}) + \alpha_2 PPE_{it} + \varepsilon_{it} \quad (4)$$

Kasznik (1999) model

The variables used in this model are presented in Equation (5):

$$ACC_{it} = \alpha_0 + \alpha_1(\Delta REV_{it} - \Delta REC_{it}) + \alpha_2 PPE_{it} + \alpha_3 \Delta CFO_{it} + \varepsilon_{it} \quad (5)$$

where

ACC_t: Total accruals

ΔREV: Change in revenue

ΔREC: Change in net receivable accounts

PPE_t: Gross property, plant and equipment per year

ΔCFO_t: Operating activities cash flow from year $t-1$ to year t, i.e. $[CFO_t–CFO_{(t-1)}]$

Kothari et al. (2005) model

Kothari *et al.* (2005) investigated the impact of business firm performance on accrual behaviour. The comparative literature review found that accrual models have inefficiency when a firm's performance is outstanding or unsatisfactory. They, thus, attempted to control the performance variable. Therefore, they presented the equation as shown below:

$$ACC_{it} = \alpha_0 + \alpha_1 \Delta REV_{it} + \alpha_2 PPE_{it} + \alpha_3 ROA_{it} + \varepsilon_{it} \quad (6)$$

where ROA is the return on assets.

Data and conceptual model

This research employed a descriptive-analytical method in terms of inference techniques. The research's statistical population includes Iranian banks listed on the Tehran Stock Exchange and/or with the Central Bank of Iran. The study sample consists of 25 IBs whose data and financial statements were available from 2005 to 2020. In this study, the econometric method of unbalanced panel data has been used due to the sample type and the lack of sample data length over time. This section reviews and examines some of the basic concepts in EM and accruals, describing the relationships and models of EM and accruals measurement.

Revenue

Revenue is one of the essential elements of financial statements. It is used to evaluate the continuity of activity, performance, and revision of the structure of revenue contracts and predict future cash flows for investors. Investors and other stakeholders pay particular attention to reported revenue, and in most cases, this factor is used as a key criterion in their decisions (Dichev and Skinner, 2002; Govahi *et al.*, 2013).

According to Statement 1 of the Accounting Concepts of the Financial Accounting Standards Board, users of financial statements have various uses for reported revenue. They can:

(1) appraise management performance

(2) evaluate company profitability over the long term

(3) predict future revenue

(4) estimate the risks of investing in or accrediting the company.

The reported revenue quality should be considered regardless of how the reported revenue amounts are used (Arabmazar-Yazdi and Karani, 2011). In this regard, individuals are looking for accurate revenue information to predict future cash flows and investor use will increase when quality financial statements are presented (Govahi *et al.*, 2013).

Earnings management

Scholars in the accounting literature proposed various definitions of EM, as summarised in Table 1. The different definitions of EM are due to distinguishable financial and accounting

Authors	Definition
Fern *et al.* (1994)	Manipulating revenue by management to achieve some expected-revenue bias
Degeorge *et al.* (1999)	A kind of artificial manipulation of revenue by management to achieve the expected revenue level for some specific purpose
Healy and Wahlen (1999)	EM transpires when administrators use their belief in financial reporting and manage the arrangement of activities to adjust financial reporting
Dichev and Skinner (2002)	Interference in reporting financial statements to gain an absolute net revenue
Pourheydari and Hemmati (2004)	A selection by the manager of accounting policies defined to achieve specific goals
Richardson *et al.* (2005)	A company's authority choosing accounting policies to meet specific organisational goals
Mashayekhi and Hosseinpour (2016)	The set of actions managers use to achieve a particular management target

Table 1. Definitions of earnings management

Source(s): Authors' own

approaches being adopted by organisations in various industries. It should also be noted that different approaches to analysing EM show that it cannot be judged as representing a praiseworthy or blameworthy event. Exploratory methods – such as case studies and surveys – should be used to determine the existence of EM in organisations, including IBs, in order to use it to improve the productivity, efficiency and effectiveness of these institutions.

Accruals

Accruals describe the difference between accounting earnings and cash flow. This means that a more significant positive accrual reflects an increase in reported profit compared to cash flow. This difference results from accounting constraints on when revenue and expense should be identified. In researching EM literature, accruals are found to be the difference between revenue (earnings) and net cash flow operations (Mahmoud-Abadi and Mansouri, 2011; Tanani *et al.*, 2016) as seen in the following:

$$Accruals = Net\ Cash\ Flow\ Operations - Earnings \tag{7}$$

One of the accruals' characteristics is that they can be considered an indicator of corporate accounting choices. In profit management research, they are usually divided into two parts: discretionary accruals and non-discretionary accruals. Discretionary accruals are EM index deviations (Pourheydari and Hemmati, 2004).

Non-discretionary accruals

Non-discretionary accruals are defined as those accruals arising in companies' business model and operating environment whereby business management is not involved in their emergence, and business activities are created during avoidable activities (Vadiee and Azimifar, 2012). In sum, non-discretionary accruals represent an obligatory expenditure or earning that is registered within the analysis procedure that has eventually to be discovered. In general, non-discretionary accruals are challenged by accounting rules, are affected by the business firm's economic conditions, and are limited by organisations' regulations and other external factors. As a result, these items are relatively safe from manipulation by management.

Discretionary accruals

Rangan (1998) believes that discretionary accruals are reviewed by management. They relate to items whose identification and recording can be controlled, delayed, deleted or expedited

by management. Discretionary accruals are applied to discover EM since they are available to manipulation by managers (Mehrani and Arefmanesh, 2008). The starting point to measuring discretionary accruals is the total sum of the accruals (Asadi and Mennati-Monjogh'tapeh, 2011).

Results and discussion

First, this paper evaluated statistical features and pre-estimation tests. Tables 2 and 3 show the results of descriptive statistics and unit root tests, respectively. This implies that the H_0 of the individual non-stationarity process is not rejected for any of the variables at a 5% significance level based on the Im, Pesaran, and Shin unit root test, unlike the Augmented Dickey–Fuller (ADF) and Phillip–Perron unit root tests. Besides, the Levin, Lin and Chu unit root test results indicate that all variables have a common unit root process. Therefore, it is preferable to check the cointegration test to ensure a long-run co-movement relation between each model's variables.

The Kao cointegration test results presented in Table 4 shows that the hypothesis of no cointegration in all four models is rejected. To specify the proper effect of panel data in the dataset of the paper, the F-Limer and Hausman tests were used, which suggest the random effect approach for all four models (Table 5).

To determine which EM measurement model is more efficient, each model is estimated separately using data collected from 2005 to 2020. Table 6 shows the estimation of the four models of EM measurement.

According to the estimated result, the *F*-statistic of all four research models confirms the overall significance at 5% level because "probability" in this test for all four models was reported to be less than 0.05.

Other goodness of fit criteria include R^2 and R^2 Adjusted. These criteria in the present study strongly determine the differences between them and compare their estimation. According to Table 6, the results of the R^2 Adj. criterion indicates substantial superiority of the Kasznik (1999) model in explaining the total accruals variable based on the model variables.

To choose from among the research models by relying on purely econometric research models can cause misunderstanding of the results. In the circumstances of these results, the conclusion would be made with the residuals and by relying on the characteristics of the residual components, which could mislead the researcher and divert the results from subsequent research steps. Montgomery *et al.* (2021) believes that in any regression estimation based on pattern theories or historical results of pattern estimation by other researchers, the specific coefficient of variation in the pattern is expected to be positive or negative before pattern estimation. For each coefficient of variation, there is an expected sign.

Therefore, considering the above and relying on the research's theoretical foundations, estimation of the coefficients in accordance with theoretical foundations and previous studies will be used to select the most appropriate model among the four models. The results of this method are reported in Table 7.

The information in Table 7 indicates that the only model whose estimation coefficients are entirely consistent with prior theoretical and research findings is the Kasznik (1999) model. Therefore, based on the research results, the Kasznik (1999) model is the most efficient estimator of discretionary accruals, which is consistent with the findings of Mohammed and Saei (2020) about selected companies in the Tehran Stock Exchange. The result is also consistent with shreds of evidence of Bahar-Moghaddam and Kohi (2012) about the relationship between EM and future profitability as well as the efficiency or opportunism of EM practice in some designated Iranian companies. Besides, the results are consistent with the findings of Palacios-Manzano *et al.* (2021) about Spanish firms with an emphasis on their

Table 2.
Descriptive statistics

	ACC	ΔREV	PPE	ΔREV–ΔREC	ΔCFO	ROA
Mean	−36489.66	3079.11	10964.21	−39456.90	1904.13	1.70
Median	−92,548	1,207	6,147	−25,479	701	1.69
Maximum	73,628	39,048	76,250	80,451	59,476	5.11
Minimum	−2,645,981	−21,475	0.001	−409,647	−86,479	−0.64
Std. dev	645,817	6147.64	20794.84	61074.24	16847.56	1.07
Skewness	−1.4107	1.8648	1.3475	−2.0864	−1.0201	0.7864
Kurtosis	9.7584	20.6417	6.7648	14.1864	8.9647	3.0648
Jarque-Bera	214.64***	1143.09***	164.76***	792.34***	97.57***	10.67**

Note(s): *, ** and *** indicate significance at the 10, 5 and 1% levels, respectively
Source(s): Authors' own calculations

	ACC	ΔREV	PPE	ΔREV–ΔREC	ΔCFO	ROA
Augmented Dickey–Fuller	44.7862***	34.4565**	41.9647***	34.9811**	20.0497**	74.9379***
Phillip–Perron	52.6707***	53.1427***	74.1748***	72.9465***	64.69743***	10.9624***
Im, Pesaran and Shin	1.30147	−0.54973	−1.09947*	−0.83479	−0.62149	0.79617
Levin, Lin and Chu	−11.2076***	−6.09471***	−7.88471***	−8.4192***	−3.99417***	−25.65841***

Note(s): *, ** and *** indicate significance at the 10, 5 and 1% levels, respectively
Source(s): Authors' own calculations

Table 3.
Unit root tests

	Variables	*t*- statistics	*p*-value
Jones (1991)	*ACC* *ΔREV* *PPE*	−7.02642	0.0000
Modified Jones (Dechow *et al.*, 1995)	*ACC* *ΔREV–ΔREC* *PPE*	−5.6470	0.0000
Kasznik (1999)	*ACC* *ΔREV–ΔREC* *PPE* *ΔCFO*	−5.48695	0.0000
Kothari *et al.* (2005)	*ACC* *ΔREV* *PPE* *ROA*	−4.96471	0.0000

Source(s): Authors' own calculations

Table 4.
Kao cointegration test

	F-Limer test statistics		Hausman test statistics
	x^2	*F*	x^2
Jones (1991)	61.9647***	12.0327	2.4731
Modified Jones (Dechow *et al.*, 1995)	70.6418***	8.6487	3.9645
Kasznik (1999)	63.7921***	7.9678	2.7764
Kothari *et al.* (2005)	79.7965***	8.1364	2.1279

Note(s): *, ** and *** indicate significance at the 10, 5 and 1% levels, respectively
Source(s): Authors' own calculations

Table 5.
F-Limer and Hausman tests

corporate social responsibility. The results are also consistent with the findings of Matis *et al.* (2010), Callao *et al.* (2017), and Chansarn and Chansarn (2016) concerning EM in Romanian companies, Eastern European countries, and small and medium enterprises (SMEs) in Thailand, respectively.

The paper's findings, however, contradict the implications of Nouri *et al.* (2013) and Jan-Ali-Zadeh (2016) about the compatibility of the modified Jones' (Dechow *et al.*, 1995)

Model	Effects	Statistic	Amount	Analysis	General model analysis
Jones (1991)	Random	R^2	0.291	Very weak	The low R^2 and R^2 Adj. have led to uncertainty about the model
		R^2_{Adj}	0.284	Very weak	
		F	20.127	Acceptable at 95% confidence interval	
		p-value	0.000		
Modified Jones (Dechow *et al.*, 1995)	Random	R^2	0.301	Very weak	The low R^2 and R^2 Adj. have led to uncertainty about the model
		R^2_{Adj}	0.284	Very weak	
		F	21.564	Acceptable at 95% confidence interval	
		p-value	0.000		
Kasznik (1999)	Random	R^2	0.934	Very strong	The high R^2, R^2 Adj. and absence of ECM concerning the F-test statistic caused a high significance level to this model
		R^2_{Adj}	0.911	Very strong	
		F	297.607	Acceptable at 95% confidence interval	
		p-value	0.000		
Kothari *et al.* (2005)	Random	R^2	0.395474	Relatively weak	The low R^2 and R^2 Adj. make the model insignificant
		R^2_{Adj}	0.299487	Relatively weak	
		F	0.514974	Acceptable at 95% confidence interval	
		p-value	0.000		

Source(s): Author's own calculations

Table 6. Estimation and analysis results of the models of Jones (1991), modified Jones (Dechow *et al.*, 1995), Kasznik (1999) and Kothari *et al.* (2005)

approach to the structure of the Iranian banking system. These results imply that consequences from various accrual principles tend to be distinctive. Besides, the results contradict the implications of Kliestik *et al.* (2020) about EM in the Czech Republic and Slovakia.

However, the research findings highlight that Islamic banking performance in Iran follows the Kasznik (1999) model as the most efficient estimator of discretionary accruals. Although EM was statistically significant, the models of Jones, modified Jones and Kothari *et al.* (2005) failed to provide coefficients consistent with the research literature. This result was confirmed by the results presented by Bahar-Moghaddam and Kohi (2012) and Govahi *et al.* (2013). They also found the Kasznik (1999) model as a model compatible with the Iranian economy's specific conditions. Jones and modified Jones models, which dedicated much of their research resources to identifying and discovering EM, do not meet statistical conditions, or they conform to theoretical foundations to estimate coefficients. Therefore, it is strongly discouraged to use these models and the Kothari *et al.* (2005) model for calculating the EM index.

Conclusion

In this study, the review of previous studies and literature on the subject of EM in both banking and non-banking studies showed that the four models of Jones (1991), modified Jones (Dechow *et al.*, 1995), Kasznik (1999) and Kothari *et al.* (2005) are the most commonly used models. It should be noted that a very high proportion of conducted studies were in

Model	Variable	Expected sign*	Estimated coefficient***	Result	The final interpretation of the model
Jones (1991)	ΔREV	Positive**	Positive	Compatible	Incompatible model coefficient
	PPE	Negative	Positive	Incompatible	
Modified Jones (Dechow *et al.*, 1995)	ΔREV–ΔREC	Positive	Negative	Incompatible	Incompatible model coefficient
	PPE	Negative	Positive	Incompatible	
Kasznik (1999)	ΔREV–ΔREC	Positive	Positive	Compatible	Compatible model coefficient
	PPE	Negative	Negative	Compatible	
	ΔCFO	Negative	Negative	Compatible	
Kothari *et al.* (2005)	ΔREV	Positive	Positive	Compatible	Incompatible model coefficient
	PPE	Negative	Positive	Compatible	
	ΔROA	Positive	Negative	Compatible	

Note(s): * The expected sign is according to the theoretical framework; this variable's sign must be positive or negative
** The expected coefficients are extracted from the theoretical framework of the research
*** The estimated coefficients are extracted from the research calculation information
Source(s): Authors' own calculations

Table 7.
Analysis of the Jones, modified Jones, Kasznik and Kothari *et al.* models

non-banking domains, and almost all of the banking sources examined in this study benefited from the modified Jones and Jones models.

In the next step, the power of estimating these four models is compared for voluntary computing accruals as EM indicators. For this purpose, the unbalanced panel method was used to estimate the models. According to the results, the Kasznik (1999) model was identified as the most capable model because of its successful passing of statistical and econometric tests for overall significance as well as the consistency of the estimated coefficients of variables in this model with previous coefficients based on previous types of research.

The Kasznik (1999) model is proposed as a model compatible with Iran's banking mechanism to support the related EM research studies in Islamic banking systems similar to the Iranian banking structure. It is evident that considering operating cash flow (OCF) is undoubtedly necessary to have consistent inter-operation about the accruals in IBs in Iran. So, OCF as the measure of the cash formed by the actions of IBs should be analyzed by regulators and policymakers to have comprehensive information about the structure of EM in the Iranian banking system because Iranian banks could provide a different range of online and offline services with different fees and easily play with the amount of daily and weekly cash flow to have a better financial statement. Besides, special attention to net account receivables could increase the power of analysis and provide better comprehension of the arrangement of IBs' EM as the other significant variable. Finally, it is essential to note that focussing on ROA, as applied by the Kothari *et al.* (2005) model, does not make sense in Iranian banks since the ROA is an insignificant variable in the conduct and performance of the banking system, and has a destructive character in the framework of EM in Iranian IBs.

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