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 aimed 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. The number of resources available to banks and their specific operational sensitivities doubles the importance of EM in this industry.

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
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 tawhīd (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.
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:

\[ ACC_{it} = EBIT_{it} - CFO_{it} \]

Accruals = Earnings Before Interest and Taxes − Net Cash Flow Operations

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:

\[ ACC_{it} = \alpha_0 + \alpha_1 \Delta \text{REV}_{it} + \alpha_2 \text{PPE}_{it} + \epsilon_{it} \]  

where

- \( ACC \): Total accruals (discretionary accruals + non-discretionary accruals)
- \( \Delta \text{REV} \): Change in revenue
- \( \text{PPE} \): Gross property, plant and equipment
- \( \epsilon \): 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):

\[ DA_{it} = ACC_{it} - NDA_{it} = ACC_{it} - \left( \hat{\alpha}_0 - \hat{\alpha}_1 \Delta \text{REV}_{it} - \hat{\alpha}_2 \text{PPE}_{it} \right) \]  

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

**Modified Jones (Dechow et al., 1995) model**
In this model, \( \Delta \text{REC} \) 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:

\[ ACC_{it} = \alpha_0 + \alpha_1 (\Delta \text{REV}_{it} - \Delta \text{REC}_{it}) + \alpha_2 \text{PPE}_{it} + \epsilon_{it} \]  

**Kasznik (1999) model**
The variables used in this model are presented in Equation (5):

\[ ACC_{it} = \alpha_0 + \alpha_1 (\Delta \text{REV}_{it} - \Delta \text{REC}_{it}) + \alpha_2 \text{PPE}_{it} + \alpha_3 \Delta \text{CFO}_{it} + \epsilon_{it} \]  

where

- \( ACC_{it} \): Total accruals
ΔREV: Change in revenue
ΔREC: Change in net receivable accounts
PPEt: Gross property, plant and equipment per year
ΔCFOt: 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:

\[
ACC_{it} = \alpha_0 + \alpha_1 \Delta REV_{it} + \alpha_2 PPE_{it} + \alpha_3 ROA_{it} + \epsilon_{it}
\]  \hspace{1cm} (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
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:

\[
\text{Accruals} = \text{Net Cash Flow Operations} - \text{Earnings}
\]  

(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

| 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  | A selection by the manager of accounting policies defined to achieve specific goals                                                         |
| (2004)                   | A company’s authority choosing accounting policies to meet specific organisational goals                                                 |
| Richardson et al. (2005)| The set of actions managers use to achieve a particular management target                                                                   |
| Mashayekhi and Hosseinpour (2016)|                                                                                                           |
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
|                  | 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  | 1684756 | 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
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)

| Variables | t- statistics | p-value |
|-----------|---------------|---------|
| Jones (1991) | ACC | −7.02642 | 0.0000 |
| | ΔREV | |
| | PPE | |
| Modified Jones (Dechow et al., 1995) | ACC | −5.6470 | 0.0000 |
| | ΔREV–ΔREC | |
| | PPE | |
| Kasznik (1999) | ACC | −5.48995 | 0.0000 |
| | ΔREV–ΔREC | |
| | PPE | |
| Kothari et al. (2005) | ACC | −4.96471 | 0.0000 |
| | ΔREV | |
| | PPE | |
| | ROA | |

Table 4. Kao cointegration test Source(s): Authors’ own calculations

| F-Liner test statistics | Hausman test statistics |
|-------------------------|-------------------------|
| x² | F | x² |
| 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) | 79.7986*** | 8.1364 | 2.1279 |

Table 5. F-Liner and Hausman tests Source(s): Authors’ own calculations

Note(s): *, ** and *** indicate significance at the 10, 5 and 1% levels, respectively
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                  | 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         | Random   | $R^2$     | 0.301  | Very weak     | The low $R^2$ and $R^2$ Adj. have led to uncertainty about the model |
| (Dechow et al., 1995)  |          | $R^2_{Adj}$ | 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   |                                                                     |
|                        |          | $F$       | 297.807| 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 |                                                                     |
|                        |          | $F$       | 514.974 | Acceptable at 95% confidence interval |                                                                     |
|                        |          | $p$-value | 0.000  |               |                                                                     |

Source(s): Author’s own calculations
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 focusing 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.

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

| Model                  | Variable | Expected sign* | Estimated coefficient*** | Result   | The final interpretation of the model |
|-----------------------|----------|----------------|--------------------------|----------|--------------------------------------|
| Jones (1991)          | $\Delta REV$ | Positive**     | Positive                 | Compatible | Incompatible model coefficient       |
| Modified Jones        | $PPE$    | Negative       | Positive                 | Incompatible | Incompatible model coefficient       |
| (Dechow et al., 1995) | $\Delta REV - \Delta REC$ | Positive | Negative                 | Incompatible | Incompatible model coefficient       |
| Kasznik (1999)        | $PPE$    | Negative       | Positive                 | Compatible | Incompatible model coefficient       |
|                       | $\Delta CFO$ | Negative | Negative                 | Compatible | Incompatible model coefficient       |
|                       | $\Delta REV$ | Positive | Positive                 | Compatible | Incompatible model coefficient       |
| Kothari et al. (2005) | $PPE$    | Negative       | Positive                 | Compatible | Incompatible model coefficient       |
|                       | $\Delta ROA$ | Positive | Negative                 | Compatible | Incompatible model coefficient       |

**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

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