

The Impact of Applying Modern Financial Analysis Tools on Detecting Fraudulent Practices in Financial Statements of Listed Banks - An Analytical Study

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ABSTRACT

The study aimed at finding out the impact of applying modern financial analysis tools on detecting fraudulent practices in financial statements of listed banks at Damascus stock exchange (DSE). Traditional tools, such as individual (univariate) financial ratios and trend analyses, proved to have lag indicators whereas modern tools, such as quantitative statistical models, have a prediction power and searching for fraudulent practices in businesses. Two models of the independent variable, two types of fraudulent practices of the dependent variable, and one moderating variable were stated. The study adopted a descriptive and analytical approach by analyzing financial statements of a sample of 11 Syrian banks using statistical approaches to test the research hypotheses. Data of this research were gathered based on a series period from 2010-2014, and processed using the statistical package of social sciences (SPSS). The main results of the study are (1) There are impacts of financial analysis tools represented by LEAM2003 and the MJ1995 models on detecting fraudulent practices in listed banks at Damascus stock exchange. This is explained by the existence of many accounting distortions leading to fraudulent accounting practices, such as distorting expenses and revenues classifications and deferring these items for future periods (fraud accounting) or recognizing recurring and nonrecurring future expenses this year with the aim of reducing the current year income (big bath accounting), exploiting the

flexibility of IFRS and twitting governance procedures and instructions. (2) There is a positive relationship between the bank size and fraudulent practices where management and accountants of banks are able to conceal accounting treatments in order to accommodate local environments. (3) It is more suitable for the Syrian context

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to apply quantitative statistical models that are more effective in detecting accounting fraudulence compared with behavioral implications and other non-statistical models. The research recommended a way of detecting fraudulent accounting practices by reducing the gap between the tax-based income and the accounting-based income, and applying the benchmarking strategy, such as Sarbanes Oxley Act.

Keywords: Financial analysis tools, fraudulent practices, Syrian listed banks

INTRODUCTION

Recent century has witnessed many attempts taking place to prevent distortion and manipulations in financial statements and reporting processes of firms, where many studies have agreed on the existence of advantages of financial reporting in businesses for stakeholders, including owners (Gill & Obradovich, 2012). Similarly, the accounting implications evolved, as time elapsed, professional ethics that are much sharper today due to the reaped knowledge arising from the ongoing problematic issues facing the auditing field (Dutta & Gigler, 2002; Kleyman, 2006). Among various issues facing the auditing profession nowadays is fraud, which involved the notion of deliberately affecting or risking the belongings of others, their interest or rights in a certain property, using the inherent flexibilities where applicable laws and standards accords permitted (Nyabuti, Memba, & Chege,

2016). Other studies went further in terms of fraudulence excreted by one or more individuals among management, whose charged with governance, employees, or third parties, involving deception practices to obtain an unjust or illegal advantages (Whittington, & Delany, 2013). Previous studies attempted to discover and detect such practices differently with one conformity purpose existed among all of them through maintaining or increasing relevance and reliability of financial statements to different internal and external users, and to avoid illegal management attempts in manipulating accounting numbers on contrary with the real condition of the firm's performance (Amat, 2004; Dorgham, Al-Halabi, & Shanikat, 2014). Thus, accumulated potential results of fraud is enormous to any economy, corporations, and individuals, led by the collapse of a giant enterprises such as what happened to Enron, and World Com (Silverstone & Davia, 2005). One attempt of defraud behavior, that is unaccepted practices, is to cook books and records to conceal true performance, to preserve personal status/control, and to maintain personal wealth/income (Kranacher, Riley, & Wells, 2011). Some studies called for new tools and strategies to limit such manipulations in financial statements (Coenen, 2008; Jackson, Sawyers, & Jenkins, 2009; Kranacher et al., 2011). On the other hand, some studies argued that management pressure can arise from various factors or enablers such as individuals being greed, personal financial problems, schooling and

medical expenses, and investment losses; and other environmental issues such as meeting analysts expectations, deadlines, and qualifying for bonuses (Kranacher, et al., 2011). However, members of directors of firms could play a role in preventing fraud through their unacceptability of fraud (Dorgham, et al., 2014; Morris, Mckay, & Oates, 2009).

In the context of audit standards, auditors differentiated between errors, deception, violation of laws and fraud in their professional works, and accordingly, auditors should understand fraud in accordance with the scope of their work (Vona, 2011). This is supported by other studies that have agreed on the existence of advantages of financial and management moderating systems in businesses for owners, board of directors, and chief financial officers, CEOs (Arens, Elder, & Beasley, 2017; Gill & Obradovich, 2012; Jiang, Zhu, & Huang, 2013).

Recently, many researchers called for more studies to discover ways, tools, and factors that affect, and be affected by, in detecting fraudulent practices by auditors, analysts, and others in firms with the aim of studying real fraudulent practices, adopting new approaches to solve consequences of these negative effects, and develop new tools and audit procedures to achieve predetermined objectives (Dorgham, et al. 2014; Greiner, Kohlbeck, & Smith, 2013; Taylor, & Ux, 2010). A further line of study pointed to the necessity of detecting informal practices that were embodied in formal systems, and referred to methods

and techniques that were difficult to detect by auditors (Jiang et al., 2013; Whittington & Delany, 2013). Other studies focused on moderating tools to support accounting and audit standards, such as improving current performance measures using financial ratios and models and providing continuous disclosures for owners of firms (Dorgham et al., 2014; Rapp, 2010). Actually, some corporations incorporated forensic tests in their audit department to detect fraud, such as comparing the employee's contact with the supplier's contact details; testing totals; and applying Benford's test to detect the transactions deviation from Benford's distribution (Swanson, 2010). It can be said that the perpetrator's position at different levels in firms appear to affect fraud losses when analyzed and reported separately, whether internally or externally (Johnson, Kuhn, Apostolou, & Hassell, 2013; Peltier-Rivest & Lanoue, 2012; Tanjitprom, 2013).

Furthermore, some studies used questionnaire forms to identify the influence of management in detecting creative accounting practices and found that the key management behavior emphasized the tax evasion process in different ways ranging from the income soothing and creative accounting to fraud accounting and big bath accounting (Nyabuti et al., 2016; Peltier-Rivest & Lanoue, 2012; Silverstone & Davia, 2005; Taylor & Xu, 2010). Other studies attempted to set out a theoretical framework with regard to creative accounting practices that emerged from developments of behavioral accounting issues in relationship with the behavior

theory and the behavior ethics of accounting (Vladu & Cuzdriorean, 2013; Vona, 2011).

The aforementioned discussion did not benefit from quantitative statistical tools that may have more impacts on detecting fraudulent accounting practices compared with the behavioral issues (Nyabuti et al., 2016). It is proven that traditional tools, such as individual (univariate) financial ratios and trend analyses, have lag indicators based on historical financial statements data, whereas modern tools, such as quantitative statistical models, have a prediction power and searching for fraudulent accounting practices in businesses (Gibson, 2009; Richardson, Sloan, Soliman, & Tuna, 2006). Moreover, there are many models that were used in previous studies, such as those that are relied on accruals in financial accounting (Modified Jones Model 1995, and Miller Model 2007); accounting changes by exploiting IAS and IFRS (e.g. Moses Model 1987, Herrmann & Inoue Model 1996); and statistical coefficients of variation and standard deviations (Leuz et. al. Model 2003, and Chaney and Lewis Model 1998) which were proved their effectiveness in detecting earnings management, fraud accounting, creative accounting and the big bath accounting in various contexts (Dechow, Sloan, & Sweeney, 1995; Leuz, Nanda, & Wysocki, 2003). It is expected that these quantitative statistical models are important in detecting fraudulent accounting practices, such as fraud accounting and the big bath accounting. While fraud accounting practices centered around transferring expenses and revenues from one period to

another within income statements, the big bath accounting focusing on recognizing recurring and nonrecurring future expenses this year aiming at reducing the current year's income (Silverstone & Davia, 2005; Stolowy & Breton, 2004).

Furthermore, despite the fact that fraudulent accounting practices existed in businesses at different degrees there were conflicting results regarding the existence of negative, positive or no relationships between fraudulent accounting practices and the firm's size (Banko, Frye, Wang, & Marie, 2013; Hovey & Naughton, 2003). More importantly, some studies indicated the positive relationship between the intention of management to exert fraudulent accounting practices and the firm's size, with the aim of achieving financial analysts' expectations (Banko et al., 2013).

This research aimed at exploring the impact of financial analysis tools, represented by the Leuz et al. of 2003 and Modified Jones of 1995 models on detecting fraudulent accounting practices in Syrian banks listed at Damascus stock exchange (DSE).

MATERIALS AND METHODS

Detecting fraudulent accounting practices may happen in different ways. First, through increasing or decreasing current profits in the interest of prior or future periods using accounting numbers in financial statements of banks, by concealing facts related to elements of income statements and balance sheets with the coverage of flexibility in IFRS. Second, through exploiting gaps in

local legislations. Third, through excessive trust in certain employees. The main problem of this research is presented to answer the following main questions:

1- What is the impact of applying the Leuz et al. model on detecting fraudulent practices (FA and BBA) in listed banks at Damascus stock exchange (DSE)?

2- What is the impact of applying the MJ model on detecting fraudulent practices (FA and BBA) in listed banks at Damascus stock exchange (DSE)?

3- What are differences on the impact of applying the Leuz et al. model on detecting fraudulent practices (FA and BBA) in listed banks at Damascus stock exchange (DSE) attributed to the bank size?

4- What are differences on the impact of applying the MJ model on detecting fraudulent practices (FA and BBA) in listed banks at Damascus stock exchange (DSE) attributed to the bank size?

The research focused on exploring the impact of financial analysis tools on detecting fraudulent practices in listed banks at Damascus stock exchange, as shown in Figure (1).

The research relied on a descriptive and analytical approach, and accordingly, the research was divided into two parts: the first part was theoretical by presenting prior literature on using selected modern financial tools to detect fraudulent accounting practices, and the second part was analytical, using the content analysis approach, by analyzing financial statements and reports of the sample studied.

Accordingly, the research hypotheses are as follows:

1- H01. There is no significant impact ($\alpha \leq 0.05$) of applying the Leuz et al. model on detecting fraudulent practices (FA and BBA) in listed banks at Damascus stock exchange (DSE).

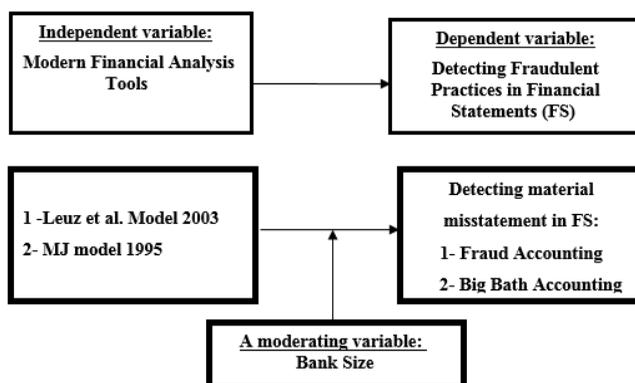


Figure 1. The impact of independent variables in dependent variables and their elements

Source: Prepared by researcher based on (Braiotta, Gazzaway, Colson, & Ramamoorti, 2010; Dorgham et al., 2014; Jackson et al., 2009)

2- H02. There is no significant impact ($\alpha \leq 0.05$) of applying the MJ model on detecting fraudulent practices (FA and BBA) in listed banks at Damascus stock exchange (DSE).

3- H03. There are no differences ($\alpha \leq 0.05$) on the impact of applying the Leuz et al. model on detecting fraudulent practices (FA and BBA) in listed banks at Damascus stock exchange (DSE) attributed to the bank size.

4- H04. There are no differences ($\alpha \leq 0.05$) on the impact of applying the MJ model on detecting fraudulent practices (FA and BBA) in listed banks at Damascus stock exchange (DSE) attributed to the bank size.

The research method represented the research population (15) listed banks at Damascus stock exchange, based on the issued fiscal year of 2015, and sources of data gathering, from which a sample of 11 listed banks (that is, 11 financial statements- for each year of the series of 5 years- that consisted of: income statements, financial position statements, ownership equity statements, cash flows statements, and all notes that constituted main parts of these statements) were processed and analyzed using a 5-year series analytical approach during the period from 2010 till 2014. The research samples of 11 banks were selected based on the following criteria:

- 1- the bank should be already listed in Damascus stock exchange during the current study;
- 2- the fiscal year for the bank should be ended at 31-12.
- 3- the bank should not face abnormal

events (such as consolidation) during the current study;

4- the bank should publish annual financial statements that are available regularly for this series of time (2010–2014).

Thus, the total number of banks that succeeded in fulfilling the aforementioned conditions is 11 (out of 15 banks) and considered as represented the sample of the study with the total cases of the content analysis is 55 (i.e., 11×5 years, the series time period of this study). Thus, average figures of the financial statements of 11 banks for each year of the period were calculated to represent the data required for the application of the two models: that is two elements of the independent variable. On the other hand, average figures of changes fraud accounting (FA) and the big bath accounting (BBA) for the same series period were also perceived and calculated to represent the dependent variable.

The two models, namely, the Leuz et al. of 2003 model (Leuz et al., 2003) and the Modified Jones J of 1995 model (Dechow et al., 1995) and their formulae are as follows:

(i) The Leuz et al. model (Leuz et al., 2003): the model is used in this study to measure and detect fraudulent practices in listed banks in the DSE with the application of the following formula:

$$SD(NOI_{i,t}) / SD(NCFO_{i,t}) \text{ Where: } \square$$

$SD(NOI_{i,t})$ = the standard deviation of net operating income for the bank i in the year t .

$SD(NCFO_{i,t})$ = the standard deviation of net cash flow from operating activities for the bank i in the year t .

The model assumed that banks that practice fraudulence, in different types, are those where: $SD(NOI_{i,t}) < SD(NCFO_{i,t})$; that is when the model output equals to one or less than one. Thus, according to the Leuz et. al. model, the bank in study could practice fraudulence if the value of the model is equal or less than one.

(ii) The Modified Jones Model 1995 (Dechow et al., 1995): The researchers Dechow et. al. 1995 were modified the Jones Model of 1991, as a result of several criticisms to Jones's model of 1991, by introducing changes in receivables accounts in addition to revenues to the Jones 1991 model. This is done through the following steps:

(1) Measuring total accruals that are measured by changes in net cash flows from operating activities and calculated as : $TACCI_{i,t} = NOI_{i,t} - NCFO_{i,t}$ where: [2] $TACCI_{i,t}$ = total accruals for the bank i , in year t .

$NOI_{i,t}$, = net operating income for the bank i , in year t .

$NCFO_{i,t}$ = net cash flows from operating activities for the bank i , in year t .

(2) Estimating the model coefficients (β) through which we reached the non-discretionary accruals. These estimates arrived by the regression for each bank (the study sample) per year (2010-2014), as follows:

$TACCI_{i,t}/At_{t-1} = \beta_1(1/At_{t-1}) + \beta_2(\Delta Rev.t - \Delta Rec.t)/At_{t-1} + \beta_3(PPE_{i,t}/At_{t-1}) + Et$ where: [3]

$TACCI_{i,t}$ = total accruals for the bank i , in the year t .

At_{t-1} = total assets in the year $t-1$

$\Delta Rev.t$ = changes in revenues from year $t-1$ to year t .

$\Delta Rec.t$ = changes in receivables from year $t-1$ to year t .

$PPE_{i,t}$ = total property, plant and equipment from year $t-1$ to year t .

Et = residual of the model.

β_1 , β_2 , and β_3 = coefficients of the model. These coefficients are used as the residuals of the regression and considered as part of the total accruals. They are indicators of the estimated discretionary accruals and represented as the discretionary accruals divided by total assets for the past year.

(4) Identifying non-discretionary accruals ($NDACCI_{i,t}$) for each bank of the sample in study. This is done for each year of the series (2010-2014) through the coefficients that were identified in step two above. This is done by the following formula:

$NDACCI_{i,t}/Ai_{t-1} = \beta_1(1/Ai_{t-1}) + \beta_2(\Delta Rev_{i,t} - \Delta Rec_{i,t})/Ai_{t-1} + \beta_3(PPE_{i,t}/Ai_{t-1})$ [4]

(4) Calculation of $NDACCI_{i,t}$ for each bank applying the following formula:

$DACCI_{i,t} = TACCI_{i,t} - NDACCI_{i,t}$ [5]

(5) As a result of the last four steps we calculated the averages of the discretionary accruals during the series time period and then did the following comparison: (i) if the absolute values of the discretionary accruals in a certain year were higher than the average values then the bank considered as practicing fraudulence and given the symbol 1; and (ii) if the absolute values

of the discretionary accruals in a certain year were lower than the average values then the bank considered as not practicing fraudulence and given the symbol 0.

Fraud Accounting: Attempts made by the management of banks to reduce changing in time series of the announced income by applying accounting techniques without changing the actual and real transactions which generated profits. This is done by transferring expenses and revenues from one period to another; or distorting these items by changing their classifications in income statements (Silverstone & Davia, 2005).

Big Bath Accounting: A way used by the management of banks to get rid of all losses in a bad year (not profitable year) when facing radical reduction in profits, thus, recognizing recurring and nonrecurring future expenses this year with the aim of reducing the current year's income (Stolowy & Breton, 2004).

Bank Size: The current study hypothesized differences on the impact of applying MJ's or Leuz et al. models on detecting fraudulent practices in listed banks in the DSE that is attributed to the bank's

size. The bank size was measured by total revenues of the bank (Hovey & Naughton, 2003).

RESULTS AND DISCUSSION

Findings of this research were shown in tables 1 to 7. Table 1 referred to the matrix of Pearson coefficients among independent variables. The results shown in this table indicated that the correlation coefficient (β) is less than 25% meaning that there is no conformity between these two independent variables.

In order to test the research hypotheses for the sample of 11 banks, the two models on the number of observations 55 (11 banks \times 5 years) were applied with the following classification: the bank/s that practice fraudulence given number 1 ; and the bank/s that did not practice fraudulence given 0. The aim is to separate those banks that were practicing fraudulence from those that were not. Results shown in Table 2 pointed to the increasing number of banks that are practicing fraudulence in the Syrian context (50 banks; and 91%).

Table 1
Matrix of Pearson coefficients in banks during the period from 2010–2014

Independent variables	Leuz et al. Model	MJ Model
Leuz et. al. Model	1	0.154
MJ Model	0.154	1
	0.215	
No. of observations	11	11

Table 2
Results related to the no. of banks that practicing fraudulence

Total no. of observations	No. of practicing fraudulence	% of practicing fraudulence	No. of non practicing fraudulence	% of non-Practicing fraudulence
55	50	91%	5	9%

Table 3
Results of the research hypothesis test -h01

Result of testing H01	Times of practicing fraudulence	% of Fraudulence	Chi Square (χ^2)	Sig.	No. of observations
55	50	91%	36.06%	50	Rejected

Note: The decision rule stated that if sig. is less than 5% then rejected the null hypothesis and the vice versa is true.

Table 4
Results related to the number of banks that practicing fraudulence - h02

Total no. of observations	No. of practicing fraudulence	% of practicing fraudulence	No. of non-practicing fraudulence	% of non-practicing fraudulence
55%	27	49%	28	51%

In order to find out the significant effect of the sample of banks that practiced fraudulence, as shown in the aforementioned table 2, the Chi Square (χ^2) test was run, where P -value represented the percentage of banks that practiced fraudulence in the DSE, and the results are shown in Table 3.

Table 3 indicated that there is a significant impact (where $\chi^2=36.06$; and sig. = 0.000) of applying the Leuz et al. model on detecting fraudulent practices (FA and BBA) in listed banks at the DSE (H01). Unlike results from Kaminski's study, who used the univariate analysis (Kaminski, Sterling,

Wetzel, & Liming, 2004), this research found the effectiveness of the Leuz et al. model (the use of multivariate analysis) that compounded ratios in detecting fraudulent practices in listed banks in the DSE.

As for the second hypothesis (H02) Table 4 identified the classification of the research sample using the MJ model with the low number of banks that were practicing fraudulence (27 banks; and 49%).

In order to test this hypothesis (H02) and the significant effect of the sample of banks practiced fraudulence the Chi Square (χ^2) test was run where P value represented

Table 5
Results of the research hypothesis test -h02

No. of observations	Times of practicing fraudulence	% of practicing fraudulence	Chi Square (χ^2)	Sig.	Result of testing H02
55	27	49%	6.04	0.002	Rejected

Note: The decision rule stated that if sig. is less than 5% then rejected the null hypothesis and the vice versa is true.

the percentage of banks that practiced fraudulence in the DSE, and the results shown in Table 5.

Results shown in Table 5 pointed to the significant impact ($\alpha = 0.002$) of applying MJ model on fraudulent practices by the management of listed banks at the DSE. Thus, there is impact of applying the MJ model on detecting accounting fraudulent practices. This implied that although the MJ model is effective on detecting accounting fraudulence but the Leuz et al. model is more effective on detecting accounting fraudulent practices in the Syrian environment. This result may be justified through the process of decision-making adopted by different qualified members of the management in Syrian banks. Moreover, the statistical models, such as the Leuz et al. model, have more impact since their parameters that can detect more fraudulent practices than mathematical models, such as the MJ model. This implication is important and in line with Islam, et al.'s study (Islam, Ruhani, & Zamri, 2011).

Findings related to the third hypothesis (H03) on whether the impact of applying the Leuz et al. model on fraudulence is

moderated by the bank size. Based on prior studies (Hovey & Naughton, 2003, p. 121) the bank size was measured by total revenues of the bank. This hypothesis was tested by one-way ANOVA test and the results shown in Table 6.

The results shown in Table 6 indicated that the significance is less than 5% (sig.= 0.004) and confirmed the interpretation power of the regression model which led to the rejection of the null hypothesis H03, meaning that there are differences (sig.= 0.004) on the impact of applying the Leuz et al. model on detecting fraudulent practices (FA and BBA) in listed banks at Damascus stock exchange (DSE) attributed to the bank size.

Similarly, findings of the fourth hypothesis (H04) on whether the impact of applying the MJ model on fraudulence is moderated by the bank size. This hypothesis was tested by one-way ANOVA test and the results shown in Table 7.

The results shown in Table 7 indicated that the significance is less than 5% (sig. = 0.000) and confirmed the interpretation power of the regression model which led to the rejection of the null hypothesis H04,

Table 6
Results of 1- way anova for the research hypothesis -h03

Result of testing H03	dF	F	Sig.	Sum of square / Model
96.1/ Regression 962.4/Residual	1 54	9.14	0.004	Rejected

Note: The decision rule stated that if sig. is less than 5% then rejected the null hypothesis and the vice versa is true.

Table 7
Results of one- way anova for the research hypothesis-h04

Sum of square / Model	df	F	Sig.	Result of testing H04
4.27E20/ Regression 7.82E20/Residual	1 54	51.03	0.000	Rejected

Note: The decision rule stated that if sig. is less than 5% then rejected the null hypothesis and the vice versa is true.

meaning that there are differences (sig. = 0.000) on the impact of applying the MJ model on detecting fraudulent practices (FA and BBA) in listed banks at the DSE attributed to the bank size.

CONCLUSION

1- There are significant indications of practicing fraudulent accounting by the management of Syrian banks listed in the DSE. Results showed that the significant indication was more when applying the Leuz et. al.'s model (91% of fraudulence practices; and sig. =0.000) compared with the MJ's model (49% of fraudulence practices; and sig.= 0.002). Thus, exaggerating provisions, expenses and losses; slack credit granting to clients; and distorting classification

of current expenses and revenues, were common fraudulent accounting practices in Syrian banks listed at the DSE. This implied that there is a need to update governance and procedures issued by the Syrian central bank and the SEC and ensure the full application of IAS and IFRS.

2- Although similar significant levels found in applying modern financial models ($\alpha \leq 0.05$) a different prediction power occurred when applying the two models (the Leuz et. al. and the MJ models). This implied that despite both models used cash flows from operating activities the Leuz et al. model included a statistical parameter with a higher prediction power compared with the MJ model that included a mathematical parameter. It also implied

the existence of constraints factors, such as unqualified and lack of independence of auditing committees', board of directors', external and internal auditors' in detecting fraudulent accounting practices committed by the management of Syrian banks.

3- Syrian banks were practicing accounting fraudulence differently. Results showed that the management with a higher bank size attempted to practice accounting fraudulence more compared with a lower bank size. This implied that the bank's size has a moderating effect, and a positive relationship, on committing accounting fraudulence and, accordingly, there is need to train people at higher management levels, whether within banks or who are in the governor's position, who are involved in accounting and audit areas in the Syrian context.

The current study recommended the following:

1. There is a need to reduce the gap between the tax-based income and the accounting-based income by creating other ways of detecting and preventing fraudulent accounting practices in economic activities.

2. More harmonization is needed between the SEC, the central bank, and other governmental agencies to reduce different conflicting instructions and updating formal procedures in accounting and audit professions and to apply the benchmarking strategy, such as the Sarbanes Oxley Act.

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