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## Earnings management determinants: Comparison between Islamic and Conventional Banks across the ASEAN region

Suripto

Department of Business Administration, Faculty of Social and Political Science, University of Lampung, Indonesia

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## ABSTRACT

This study aims to analyze company characteristics as a determinant of conventional and Islamic bank earnings management in several ASEAN countries (Association of Southeast Asian Nations). The Multiple Discriminant Analysis was used to determine the differences between Islamic and Conventional Banks. This test was conducted based on Capital Adequacy Ratio, Income Before Tax and Interest, Non-Performing and Changing Loans, Company's Size, CPI, and Kurs in banks located in Indonesia, Malaysia, and Brunei Darussalam from 2014 to 2020. The data obtained from 40 banking entities were analyzed discriminatively. The results showed simultaneous differences between Capital Adequacy Ratio, Income Before Tax and Interest, Non-Performing and Changing Loans, Company's Size, CPI, and Kurs as determinants of earnings management between Islamic and conventional banks. It also showed that the Company's Size was the dominant variable determining the management differences. Based on Discriminant Analysis, there were significant differences in conventional and Islamic earnings management determinants. The Changing Loan variable showed the highest contribution in determining earnings management in Islamic banks. Overall, this study found that conventional banks dominated the Islamic system in practicing earnings management.

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## 1. Introduction

A critical question in the current banking system is how management provides valid and reliable financial information. This behavior is closely related to earnings management, which determines the income size. The current banking systems contain varying profit sharing and interest-based systems, well-known by Islamic and conventional banks, which affect management behavior in terms of earnings. Therefore, there is a need to conduct a study of earnings management in both Islamic and conventional banks to address the problem faced in controlling income (Lobo, 2017). Earnings management is a unique and interesting topic that develops more accurate proxies in bank settings due to its relatively homogeneous sample (Garsva, Skuodas, & Rudzioniene, 2012).

Preliminary studies were conducted on this topic by Elnahass,

Izzeldin, and Steele (2018), Mozayani and Parvizi (2016), Packer and Zhu (2012), and Savitri, Andreas, Syahza, Gumanti, and Abdullah (2020). Meanwhile, Chan, Li, and Lin (2019) found that Islamic banking status does not determine earnings management.

Furthermore, Othman and Mersni (2014), Kao, Chen, and Lu (2018), and Suzuki, Uddin, and Sigit (2019) examined the factors influencing Islamic and conventional banking policies in three countries, namely Indonesia, Malaysia, and Brunei Darussalam. They stated that Islamic banking policy examined by DLL, capital, and earnings management is more reliable than conventional and weaker in terms of NPLs. This finding indicated that the behaviour of Islamic banking earnings management is different from conventional.

Islamic banking is based on Profile and Loss Sharing (PLS), while conventional system is associated with interest. The principles of Islamic banking operationally apply mudarabah and musharakah techniques sourced from classical jurisprudence to avoid (usury) interest. Therefore, in their empirical study, Prima Sakti and Mohamad (2018), and Suripto and Supriyanto (2021) stated that real and different economic activities support business transactions in Islamic banking.

Abbreviations: ASEAN, Association of South East Asia Nations.

E-mail address: [Suriptob.1969@fisip.unila.ac.id](mailto:Suriptob.1969@fisip.unila.ac.id).

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recognizes profit or expense, which is a management choice. In contrast, non-discretionary accruals recognize reasonable profit that affects the financial statements (Faradila & Cahyati, 2013). Several factors influence earnings management using LLP, such as Capital Adequacy Ratio (CAR), Earnings before Tax, Loan Loss Provisions (EBTLLP), Non-Performing Loans (NPL), Change Loans (CLOANS), and Size.

CAR is a bank capital expressed as a percentage of the weighted risk. The minimum ratio guarantees them to absorb the losses before experiencing financial difficulties (Mili, Sahut, Trimeche, & Teulon, 2017)<sup>3</sup>.

A high allowance when capital is low is consistent with a reduced capital acquisition cost that correlates with more exceptional LLP practices (Packer & Zhu, 2012). Furthermore, EBTLLP measures the bank's ability to use assets in generating income before tax and LLP (Elnahass et al., 2018). Good quality assets increase higher profitability, therefore, it is imperative for banks to efficiently manage them and other factors of profitability (Swamy, 2017; Rafay, Farid, Yasser, & Safdar, 2020).

Meanwhile, Non-Performing Loans (NPL) is the ratio of impaired to the total loans. Change Loans (CLOANS) transform the total loans from the current and the previous year (Elnahass et al., 2018). Variable NPL and CLOANS are used to measure the credit quality because it is more of risk than other assets, such as cash, reserves, and bonds. Therefore, high loans are associated with low credit quality (Packer & Zhu, 2012). Size is related to the company's internal control system, which reduces the suspicion of earnings management. Large companies have more effective internal control systems and competent auditor teams than smaller ones.

This led to the reliability of the public financial statements (Ali et al., 2015). Abdelsalam, Dimitropoulos, Elnahass, and Leventis (2016) and Lassoued et al. (2018) examined the banks in middle-

east and north Africa countries, in which conventional-based management earnings more than the Islamic. Islamic banks tend to manage income by reporting earnings and discretionary accrual cases. Caporale, Alessi, Di Colli, and Lopez's (2018) research showed that earnings management in Italian banks is counter-cyclical with non-discretionary components, while macroeconomic shocks play an important role.

CKPN has fewer occurrences in local banks because their loans are more guaranteed, and supervisory activities strongly influence their behaviour.

Nadzifah and Sriyana's (2020) research conducted in Indonesia reported that CPI and exchange rates in sharia-based and conventional banks influence earnings management. Similarly, Hidayati (2014) stated that managers identify that when the exchange rate appreciates or depreciates, it impacts bank profitability in conventional and Islamic banks.

The study by Shawtari, Ariff, and Abdul Razak (2019) conducted in Indonesia stated that earnings management at Islamic-based banks is lower than conventional, similar to Othman and Mersni's (2014) research. Pinto and Ng Picoto (2018) stated that managers use LLP to manage income and capital regulation. The key provisions of LLP are size and NPL, while Elnahass et al. (2018) reported the practice of earnings management through CKPN in conventional-based, especially in large banks that suffered losses. Conversely, Islamic systems tend not to use CKPN in earnings or capital management. The difference is due to the limited Islamic banking business model, strict governance, and ethical orientation.

The following table explains previous research related to the ASEAN region.

No.	Researcher	Variable	Research result
1	Abdelsalam et al. (2016)	CKPN NPL Loan IB Ownership year	Islamic banks are smaller in managing income and adopting to more conservative accounting policies.
2	Caporale et al. (2018)	CKPN NPL NPL loan IS STAMP SIGN GDP Crisis	The results show that LLP in Italian banks is counter-cyclical, with non-discretionary components and macroeconomic shocks playing an important role. Moreover, LLPs are less cyclical in the case of local banks because their loans are more secured with more strongly behavior influenced by supervisory activities.
3	Pinto and Ng Picoto (2018)	CKPN NRE STAMP NPL GDP T Listed	Bank managers use CKPN to manage income and capital regulation. The key provisions are bank size and NPL.
4	Elnahass et al. (2018)	CKPN Tier 1 EBTLLP NPL loans Listing Crisis GDP IB	There is a practice of earnings management through CKPN in conventional banks, especially in large ones that experience losses. Conversely, Islamic banks tend not to use CKPN in managing earnings or capital. The difference is due to the limited Islamic banking business model, strict governance, and ethical orientation.
5	Mohd Isa et al. (2018)	CKPN NPL Interest Income Net Profit Loans GDP	Provisions of loan loss and non-performing loans are determined by interest income, loans and advances, net income, and Gross Domestic Product, the moderating effect of credit risk management, and the interference effect of relevance and faithful representation, which are determinants of loan loss provisions. The moderate variable of credit risk management strengthens the relationship between the independent and dependent variables. Intervening variables relevance and loyal representatives leads to more accurate reporting of the extent of loan loss provisions.
6	Lassoued et al. (2018)	CKPN LLA NCO Loans Loans NPL Loan Categories Country Control Year Control	Islamic bank manages less income than conventional, while both use discretionary loan loss provisions to manage income. Institutional owners encourage earnings management in Islamic banks, and state participation increases earnings management in conventional banks.
7	Alhadab and Al-Own (2019)	CKPN EQIN EBTLLP CPTR Size Leverage Crisis IFRS Country	Earnings improve earnings management through CKPN practiced by European bank executives motivated by executive compensation.

<sup>3</sup> Capital Adequacy Ratio (CAR) (Alhadab & Al-Own, 2019), Earnings Before Tax and Loan Loss Provisions (EBTLLP) (Elnahass et al., 2018), (Chan & Lin, 2017). Non-Performing Loans (NPL) (Hermuningsih et al., 2020). Change Loans (CLOANS) (Alhadab & Al-Own, 2019). Size (Kartikasari & Merianti, 2016), (Jaisinghani & Kanjilal, 2017) and (Mamipour & Sepahi, 2015), Corruption Perception Index (CPI) (Joseph et al., 2016), Kurs (Nadzifah & Sriyana, 2020).

### 3. Data and variables

The data used in this study was obtained from the annual reports of Indonesia, Malaysia, and Brunei Darussalam Bank. The number of samples was 40 banks, consisting of 20 from conventional and 20 from Islamic banks, from 2014 to 2020. This study compares the variables of conventional and Islamic banking in Indonesia, Malaysia, and Brunei Darussalam, which included CAR for capital measurement, EBTLLP for assessing credit risks, and company size for evaluating the firm magnitude classified as large, medium, or small.

#### 3.1. Conceptual Definition of Variable

No. Variable	Definition	Source
1. Earnings management	Earnings management is the manipulation of financial statements by managers, using choices, estimates, and accounting methods, to achieve several goals that are largely at odds with the underlying economic status of the firm.	Ahmed et al. (2014)
2. Capital Adequacy Ratio (CAR)	For safety in the modern banking system, banks need to plan a certain amount of capital to support the growth of productive assets according to the bank's work plan.	Alhadab and Al-Own (2019)
3. Earnings Before Tax and Loan Loss Provisions (EBTLLP)	EBTLLP is the capacity measurement in using its assets to generate earnings before its liabilities and CKPN.	Elnahass et al. (2018)
4. Non-performing Loan (NPL)	The main cause of bank failure is due to bad credit with the high NPL offset by the increase in the level of reserves.	Alshebmi et al. (2020)
5. Change Loans (CLOANS)	Changes in the current year's credit score with the previous year.	Alhadab and Al-Own (2019)
6. Size	Company size is a manifestation of the total assets owned, which includes capital, as well as rights and obligations owned.	Dewi and Indriani (2016)
7. Corruption Perception Index (CPI)	The corruption perception index data issued annually by TI is believed to be valid data in measuring the corrupt practices of a country.	Joseph Joseph et al. (2016)
8. Kurs	The foreign exchange rate shows the value of one country's currency expressed in terms of another currency	Nadzifah and Sriyana (2020)

Source: the authors' Conceptual Definition of Variable.

#### Definition of Operational Variables

##### Capital Adequacy Ratio (CAR)

CAR is the assessment of the modern banking system's safety. Banks are required to plan a certain amount from the capital to support the growth of productive assets that are in line with their working plan (Alhadab & Al-Own, 2019). This ratio identifies bankability in providing reserve funds to minimize loss risks.

H1 = There is a significant difference in Capital Adequacy Ratio (CAR) in earnings management between conventional and Islamic banks.

##### Earnings Before Tax and Loan Loss Provisions (EBTLLP)

EBTLLP is the capacity measurement in using its assets to generate earnings before its liabilities and CKPN (Chan & Lin, 2017; Elnahass et al., 2018). This ratio is measured as the banks' earnings before the reserve's impairment loss on total bank assets.

H2 = There is a significant difference in Earnings Before Tax and Loan Loss Provisions (EBTLLP) on earnings management between conventional and Islamic banks.

##### Non-Performing Loans (NPL)

NPL is the measurement of impaired credits, which is the main reason for default in banks. According to Hermuningsih, Sari, and Rahmawati (2020), high NPL needs to be balanced with increased reserve funds. It is also defined as the inability of customers to pay part or all of their obligations to the bank.

H3 = There is a significant difference in Non-Performing Loans (NPL) on earnings management between conventional and Islamic banks.

##### Change Loans (CLOANS)

Change loans are the changes in the current year's credit value

from the previous (Alhadab & Al-Own, 2019).

H4 = There is a significant difference in Change Loans (CLOANS) on earnings management between conventional and Islamic banks.

Size  
The company's size is an embodiment of the total owned assets, which includes the capital, rights, and obligations (Jaisinghani & Kanjilal, 2017; Kartikasari & Merianti, 2016; Mamipour & Sepahi, 2015). The firm or business size was based on several elements, such as the total assets.

H5 = There is a significant difference in earning management size between conventional and Islamic banks.

##### Corruption Perception Index (CPI)

The corruption perception index data issued annually by TI is believed to be valid in measuring the corrupt practices (Joseph Joseph, Gunawan, Sawani, Rahmat, Avelind Noyem, & Darus, 2016).

H6 = There is a significant difference in CPI of earnings management between conventional and Islamic banks.

The VECM estimation results for conventional and Islamic banks show that the exchange rate has a positive and significant effect in the long term. The results are in line with (Hidayati, 2014) which stated that currency exchange rates influence profitability banking. The existence of this influence indicates that if the exchange rate appreciates or depreciates, it impacts the level of banking profitability.

H7 = There is a significant difference in kurs of earnings management between conventional and Islamic banks.

##### Multiple Discriminant Analysis (MDA)

Multiple discriminant analysis has two main steps, the first is the F-Test (Wilks Lambda) used to determine whether this model as a whole is significant or insignificant. Second, assuming the F-Test shows significant value, and then each independent variable is assessed for their differences. In the average group, it is used to classify the dependent variable. The discriminant equation is formulated as follows:

Where

L = linear combination of discriminating (independent) variable

b1 – bn = discriminant coefficient

c = constant value

X1 = capital adequacy ratio (CAR)

X2 = earning before tax and loan loss provisions (EBTLLP)



X3 = non-performing loans (NPL)

X4 = change loans

X5 = size

X6 = CPI

X7 = Kurs

The Determinant of Cut-Off Value

Both groups observed in this study have several samples, therefore, the equation applied to determine the cut-off point is as follows.

Where

ZCU = critical point, as a function of cut-off score ZA and

ZB = centroid number for group 1 and 2

NA and NB = number of group 1 and 2

The cut-off determination is based on the average value of the total Z-score from each bank, which is 0.0000. The standard for measuring whether banks are classified as conventional or Islamic is as follows<sup>4</sup>.

- When Z-score statistic <0.000, the bank is classified as a Islamic.
- When Z-score statistic >0.000, the bank is classified as conventional.

#### 4. Empirical results

The descriptive analysis of Islamic and conventional banking is shown in Table 1 with the following variables, Capital Adequacy Ratio, Income Before Tax and Interest, Non-Performing and Changing Loans, Company's Size, CPI and Kurs.

First, the statistical range of 15.69% and 151.92% in conventional and Islamic banking showed a significant difference in CAR. Similarly, the statistical range values differed significantly in EBTLLP, by 4.51% in conventional and 13.45% in Islamic banking. Furthermore, the statistical range of conventional (13.05%) and Islamic banking (61.20%) also showed significant differences in CLOANS. An insignificant comparison between both banking systems occurred in the NPL and firm size variables with a statistical comparison of 9.06%: 4.95% for NPL, and 6.29%: 5.82% for the Company's Size, respectively. Based on these values, there were significant differences between Islamic and conventional banking in the five determinants of earnings management. This showed that Islamic banking did not follow the business model of the conventional system in earnings management practices.

Second, a discriminant analysis was carried out by identifying variables significant in distinguishing earnings management between Islamic and conventional banking. From the equality test, the variable values, namely CAR, EBTLLP, CLOANS, Size, CPI, and kurs, were below 0.05. These test results showed differences between the groups or determining variables. However, the NPL variable had a significant value above 0.05, which means there was no difference between the groups, or the values are relatively the same.

Third, the MDA model was used to determine the discriminant equation of the selected variables, which started with the most significant F value. In the first stage, the calculated F-Size value was 0.573, while NPI, CLOANS, and EBTLLP were 0.471, 0.461, and 0.451. Finally, the cut-off value was determined based on the average value of the Z-Score. For the Multiple Discriminant Analysis (MDA) model, the Z-Score of each bank was 0,000 and categorized Islamic

**Table 1**

Statistical descriptive.

Variable	N	Min	Max	Mean	Std. Error	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
CAR	280	11%	26.21%	18.0035%	0.32691%	3.26912%
	280	11.15%	163.07%	21.6335%	1.71102%	17.11025%
EBTLLP	280	0.00%	4.81%	2.4570%	0.12965%	1.29651%
	280	-0.36%	13.08%	1.9395%	0.20215%	2.02150%
NPL	280	0.00%	9.46%	2.4524%	0.18672%	1.86721%
	280	0.02%	4.97%	2.0470%	0.15384%	1.53839%
CLOANS	280	0.00%	13.28%	4.6773%	0.28338%	2.83384%
	280	0.05%	61.26%	9.2239%	0.84000%	8.39995%
SIZE	280	7.7757	14.075	11.85359	.137108	1.3710764
	280	6.4953	12.325	9.598000	.125316	1.2531569
CPI	280	36%	63%	43.655%	0.606%	7.19%
	280	36%	63%	43.655%	0.606%	7.19%
KURS	280	1.20%	14.60%	8005%	0.284%	4755%
	280	1.20%	14.60%	8005%	0.284%	4755%

Source: the authors' calculations in Multiple Discriminant Analysis according to the statistical data.

or conventional-based system when it is < 0.000, or > 0.000.

Descriptive analysis of the comparison of CAR in conventional and Islamic banking. The CAR variable in conventional banks has minimum and maximum values of 11% and 26.21%, with an overall mean of 18,0035%. A high CAR value indicates that the level of earnings management in conventional banking is high. Meanwhile, an increased mean value indicates a rise in CAR, which increases earnings management practices.

Similarly, the CAR variable in Islamic banking shows a high value improved earnings management, determined from the maximum, minimum, and mean values of 163.07%, 11.15%, and 21.6335%. The standard deviation has a difference in the value of 19.84113%, where Islamic banks have a higher value of 17.11025% while conventional is 3.26912%. Therefore, it can be said that the data on CAR in Islamic banking is more diverse than conventional banks.

Descriptive analysis of the comparison of EBTLLP between conventional banks and Islamic banks. The EBTLLP variable in conventional banks has maximum, minimum, and mean values of 4.81%, 0.30%, and 2.4570%. Therefore, a high EBTLLP value indicates an increase in the level of earnings management in conventional banking. A high mean value indicates an increase in EBTLLP, which leads to a rise in earnings management practices.

The EBTLLP variable in Islamic banks has maximum, minimum, and mean values of 13.08%, -0.36%, and 1.9395%. The mean value of EBTLLP in Islamic banks is lower than conventional, which indicates a decrease in the level of earnings management in Islamic banking. The standard deviation has a difference in the value of 0.72499%, where Islamic banks are higher by 2.02150%, and conventional are 1.29651%

Therefore, the data on earnings management in Islamic banking is more diverse than conventional.

Descriptive analysis of the comparison of conventional and Islamic banking NPLs. The NPL variable in conventional banks has maximum, minimum, and mean values of 9.46%, 0.40%, and 2.4524%. Therefore, a high NPL value indicates that the level of earnings management in conventional banking is high. This means that an increase in value indicates a rise in NPL earnings management practices.

The NPL variable in Islamic banks has maximum, minimum, and mean values of 4.97%, 0.02%, and 2.0470%. Therefore, the decrease in NPL value indicates that the level of earnings management in Islamic banking is low. A decrease in mean value indicates an increase in NPL, which reduces earnings management practices. The standard deviation has a value difference of 0.32882%, higher in

<sup>4</sup> There are numerous models for gauging earnings management, Multiple discriminant analysis have two main steps, the first step is the F-Test (Wilks Lambda) used to determine whether this model as a whole is significant or not. Second, assuming the F-Test shows significant value, then each independent variable is assessed for their differences. In the average group, this is used to classify the dependent variable.

conventional banks by 1.86721% and 1.53839% in Islamic banks.

Descriptive analysis of the comparison of Change Loans between conventional banks and Islamic banks. The CLOANS variable in conventional banks has maximum, minimum, and mean values of 13.28%, 0.23%, and 4.6773%. A decrease in CLOANS value indicates that the level of earnings management in conventional banking is low. A decrease in mean value indicates a decrease in CLOANS, which reduces earnings management practices.

The CLOANS variable in Islamic banks has maximum, minimum, and mean values of 61.26%, 0.05%, and 9.2239%. An increase in CLOANS value indicates a high level of earnings management in Islamic banking. In contrast, a rise in mean value indicates an increase in CLOANS, which improves earnings management practices. The standard deviation has a difference in the value of 5.56611%, where Islamic banks have a higher value of 8.39995% while the conventional is 2.83384%. Therefore, the data regarding change loan in Islamic banks is more diverse than conventional banks.

Descriptive analysis of size comparison between conventional banks and Islamic banks. Size in conventional banks has maximum, minimum, and mean values of 14,075, 7.7757, and 11,85359. A high size value indicates that the level of earnings management in conventional banking is low. Meanwhile, an increase in mean value indicates a rise in assets capable of reducing earnings management practices.

The variable size in Islamic banks has maximum, minimum, and mean values of 12,325, 6.4953, and 9.598000. Therefore, a low size value indicates that the level of earnings management in banking is high. Meanwhile, a low mean value indicates a decrease in assets that increases earnings management practices. The standard deviation has a difference in the value of 0.11791952, where conventional banks have a higher value of 1.37107639 while Islamic is 1.25315687. Therefore, it can be said that the data on size in conventional banking is more diverse than in Islamic.

Descriptive analysis of the Corruption Perception Index (CPI) has maximum, minimum, mean, and standard deviation values of 63%, 36%, 43.65%, and 7.19%. Therefore, a high Corruption Perception Index (CPI) indicates that the level of earnings management in conventional banking is low.

Descriptive analysis of the exchange rate has a maximum value of a minimum value of 1.20% and an average value of 8.0057%, with a standard deviation of 4.755%. It is said that a high exchange rate indicates that the level of earnings management in conventional banking is getting higher.

#### Normality Test

The data shown in Table 2 are from the Kolmogorov-Smirnov normality test. The table shows that all independent variables have a significance value of 0.000, less than 0.05. This means that the independent variables are distributed to meet the assumptions used for discriminant analysis.

The data shown in Table 3 are from the box's M test showed that the F value and significance were 691.726. and 0.000. The

**Table 2**

One-sample Kolmogorov-Smirnov Test.

N		Unstandardized Residual 280
Normal	Mean	1.5000
Parameters <sup>a,b</sup>	Std. Deviation	.50090
Most Extreme Differences	Absolute	.341
	Positive	.341
	Negative	-.341
Test Statistic		.341
Asymp. Sig. (2-tailed)		.000 <sup>c,d</sup>

Source: the authors' calculations in Multiple Discriminant Analysis according to the statistical data

**Table 3**

Box's M Test.

Test Results	
Box's M	691.726
Approx. df1	24.047
df2	28
Sig	269301.779
	.000

Tests null hypothesis of equal population co-variance matrices.

Source: the authors' calculations in Multiple Discriminant Analysis according to the statistical data.

significant value below 0.005 caused the co-variance matrix between the groups to violate the discriminant assumption. However, the analysis of discriminant functions remained strong although the assumption of variance homogeneity did not correlate.

Table 4 shows that the values of CAR, EBTLLP, CLOANS and SIZE are significant, but NPL, CPI and KURS are not significant.

Table 5 shows that the function of the group centroid provided the information on the average discriminant score. The discriminant score for conventional banks was 1.129 and -1.129 for Islamic, therefore, there was a stipulated cut-off value. Meanwhile, the cut-off point of the discriminant function was calculated as follows:

Information:

ZCU = cut-off score

ZA and ZB = centroid values for group 1 and 2

NA dan NB = number of group 1 and 2

From the MDA model, the cut-off determination was based on the average value of the Z-Score from each bank (0.000). The standards used to assess whether the bank was categorized as an Islamic or conventional bank were as follows:

When Z-Score was calculated as <0.000, the bank was classified as a Islamic.

When Z-Score was > 0.000, the bank was classed as a conventional.

Wilk's Lambda Test

Based on Wilk's Lambda test in Table 6, the Size, NPL, CLOANS,

**Table 4**

Discriminant analysis.

	Tests of Equality of Group Means				
	Wilks' Lambda	F	df1	df2	Sig.
CAR	.974	7.321	1	278	.038
EBTLLP	.984	4.398	1	278	.032
NPL	.983	4.684	1	278	.095
CLOANS	.883	36.809	1	278	.000
SIZE	.583	198.857	1	278	.000
CPI	1.000	0.000	1	278	1.000
KURS	1.000	0.000	1	278	1.000

Source: the authors' calculations in Multiple Discriminant Analysis according to statistical data.

**Table 5**

The determination of cut-off value.

Functions at Group Centroids	
Bank System	Function
Conventional Bank	1
Islamic Bank	-1.129
Unstandardized canonical discriminant functions evaluated at group means	

Source: the authors' calculations in Multiple Discriminant Analysis according to statistical data.

and EBTLLP had a significance value of 0.000 less than 0.05. Therefore, all independent variables included in the MDA model had significant effects. Therefore, Size, NPL, CLOANS, EBTLLP, CPI, and Kurs significantly affected Islamic and conventional banking earnings management.

A canonical correlation was used to measure the closeness of the relationship between the discriminant scores in the two groups.

Table 6 was used to determine the CR value of 0.741. When squared, it was found that 54.9% of variables explained the variation. Therefore, the EBTLLP, NPL, CLOAN, and Size variables explained the difference between Islamic and conventional banking groups. The Equation Model from the Discriminant Analysis Function results is as follows:

$$Z = (-8.481) + 0.933 \text{ CAR} + 12.907 \text{ EBTLLP} + 36.002 \text{ NPL} - 4.986 \text{ CLOANS} + 0.839 \text{ SIZE} - 0.021 \text{ CPI} - 0.072 \text{ KURS}$$

#### Accuracy of Classification Prediction

Based on the table below, the prediction accuracy was 89%, while those for conventional and Islamic systems were 91% and 87%. Misclassification in the conventional banking was 9% and 13% for the Islamic system because the value of earnings management was initially classified as conventional banking. After being calculated turns it was in the Islamic system, and vice versa.

Table 8 shows that the control variable, namely size, was removed from the model to test the robustness. This indicates that the model's resilience shows significant results similar to the Size variable before and after being removed from the tested model. Based on the Robust test, the following results were obtained:

The variables CAR, EBTLLP, CLOANS, and SIZE are significant determinants of earnings management between Islamic and conventional banks. Meanwhile, NPL, CPI, and KURS are insignificant, and together these four variables are consistent as determinants of earnings management differences.

Based on the results shown in Table 7, the EBTLLP, NPL, CLOANS, and Size variables were used to determine Islamic and conventional banking earnings management. The EBTLLP, CLOANS, and Size variables had a higher value compared to Islamic banking, thereby making this variable a determinant in conventional banking earnings management. The CLOANS variable in Islamic banking was more significant than the conventional system. Meanwhile, the CAR variable did not enter or meet the requirements in the discriminant model.

The result is in line with Othman and Mersni's (2014) research which stated that CAR was significantly higher in Islamic than conventional banking with a positive earnings management relationship. Therefore, the higher the CAR value, the greater the manager performs earnings management and vice versa. However, this variable was not included in the function equation because it did not meet the requirements.

The findings showed that the average value of EBTLLP had a significant difference between Islamic and conventional banking.

**Table 6**

Wilk's Lambda.

Number of Exact	F	Lambda			Statistic		
		df1	df2	df3	df	df1	Sig
1	.573	1	198	147.458	1	198.000	1.000
2	.471	1	198	110.702	2	197.000	2.000
3	.461	1	198	76.465		196.000	3.000
4	.451	1	198	59.346		195.000	4.000
Eigenvalue	% of Variance	Cumulative	% Correlation				
1.217a	100.0	100.0	0.741				

Source: the authors' calculations in Multiple Discriminant Analysis according to statistical data.

**Table 7**

Classification results.

	Banking System		Predicted Group Membership		Total
	Conventional		Islamic		
Original 100%	Count	Conventional	91	9	
	Islamic	13	87	100	
	Conventional		91.0	9.0	100.0
Cross-validatedb 100%	Islamic	13.0	87.0	100.0	
	Count	Conventional		89	11
	Islamic	13	87	100	
	Conventional		89.0	11.0	100.0
	Islamic	13.0	87.0	100.0	

Source: the authors' calculations in Multiple Discriminant Analysis according to statistical data.

**Table 8**

Robustness Test results.

	Tests of Robustness test Equality of Group				
	Wilks' Lambda	F	df1	df	Sis
CA	.97	7.32		78	0.007
EBTLLP	4	1		78	0.037
NP	.98 4	44.68		78	0.162
CLOAN	.98	43		78	0.000
SIZ	3	198.85		78	0.000
<sup>E</sup> C PI	1.00	<sup>7</sup> 0.00		78	1.000
KUE	0	0		78	1.000

Source: the authors' calculations in Multiple Discriminant Analysis according to statistical data.

The average value of EBTLLP in conventional was higher than in Islamic banking, which is in line with Lassoued et al.'s (2018) research. Dou, Ryan, and Zou (2018), Ceccobelli and Giosi (2019), and Bouvatier, Lepetit, and Strobel (2014) showed significant results between EBTLLP and CKPN. In Islamic banking, managers were not allowed to manipulate earnings because it misleads users of financial statements. EBTLLP had a positive relationship with earnings management. The higher the profit generated, the greater the manager performs earnings management, and vice versa.

The results show an insignificant difference between the NPLs in Islamic and conventional banking. Based on the descriptive analysis, the average value of NPL in conventional banking was higher than Islamic system. This was in line with the research by Elnahass et al. (2018) and Othman and Mersni (2014), stating that NPL is less significant in Islamic banking. This variable has a positive relationship with earnings management, and the higher the NPL value, the greater the manager performs earnings management and vice versa.

Based on the results, there was a significant difference between the CLOANS in Islamic and conventional banking. This is in line with



the descriptive analysis, where the average value of CLOANS in Islamic banking was higher than a conventional system. According to Elnahass et al. (2018), changes in loans were less significant in Islamic banking. This was also strengthened by Quttainah et al. (2013), stating that CLOANS was significant for CKPN. The variable had positive relationship with earnings management because the greater the value of CLOANS, the higher earnings management, and vice versa.

This study focuses on investigating the determinants of earnings management between conventional and Islamic. It also determined the factor that makes the difference. Meanwhile, research in Jordan examines Islamic compliance on the profitability of Islamic banks, with both conducted using the control size variable. This research was equally carried out in developing countries. Research in Jordan does not include earnings management as a determinant of profitability. Conversely, this study examines profitability as a determinant of earnings management between Islamic and conventional banks. This study contributes to the growing body of literature on Islamic finance.

The results show that the Company's size significantly differed between both banking systems. The descriptive analysis indicated that conventional banking size's average value was more significant than the Islamic system. This was in line with the study of Elnahass et al. (2018), Lassoued et al. (2018), and Ceccobelli and Giosi (2019) stated that earnings management was commonly used in conventional banking in large companies. Ahmed, Mohammed, and Adisa's (2014) research showed that Islamic banking practices low management. Therefore, the size variable had a negative relationship with earnings management because the larger the company's size, the lower the profit management, and vice versa.

The Corruption Perception Index (CPI) has a descriptive analysis value indicating that the average value of the Corruption Perception Index (CPI) of conventional banking is greater than the Islamic system. This is in line with Joseph Joseph et al. (2016) research, which stated that earnings management is generally used in conventional banking in large companies. Therefore, the Corruption Perception Index (CPI) variable has a negative relationship with earnings management. The greater the Corruption Perception Index (CPI) value, the lower the earnings management, and vice versa.

This descriptive analysis shows that the average value of the conventional banking exchange rate is greater than the sharia system. It is in line with Nadzifah and Sriyana's (2020) research that earnings management is generally used in conventional banking in large companies. Therefore, the exchange rate variable has a negative relationship with earnings management. In addition, the more excellent the exchange rate value, the lower the earnings management, and vice versa.

## 5. Concluding remarks

In conclusion, the data obtained from 280 banking entities were analyzed in a discriminatory manner, and the findings show that EBTLLP, NPL, CLOANS, and Size are different variables that determine earnings management between conventional and Islamic banks. The result showed that EBTLLP, CLOANS, and Size have significant differences instead of NPL, CPI, and KURS. From the discriminant equation, the most dominant average ratio in predicting differences in earnings management between banking groups are CAR, EBTLLP, Size, and Exchange rate, most widely used in determining earnings management in conventional banks, while CLOANS is used in the sharia system. Overall, this study finds that

conventional banks dominate the Islamic system in conducting earnings management.

This study filled the gaps in the existing literature to investigate the determinants of differences in Islamic and conventional earnings management. It is limited to the use of information panels covering only five years, which was insufficient to validate the results' consistency. Future studies need to increase the period to provide confirmation of the findings and greater robustness of the data collection method. This study has laid the foundation for subsequent ones on the determinants of earnings management difference between Islamic and conventional banks. Therefore, it is better to add variables other than CAR, EBTLLP, NPL, CLOANS, CPI, and KURS in future studies. Furthermore, the Robustness test results are better to add a control and external variable other than size.

The results showed that there were simultaneous differences between Capital Adequacy Ratio, Income Before Tax and Interest, Non-Performing and Changing Loans, Company's Size, CPI, and Kurs as determinants of earnings management between Islamic and conventional banks. In addition, it was found that Kurs, Company's Size was the dominant variable determining the management differences. Based on Discriminant Analysis, there were significant differences in both banks' earnings management determinants. Meanwhile, the highest contribution of Changing Loan variable in determining earnings management in Islamic banks was also shown. Overall, this study found that conventional banks dominated the Islamic system in practicing earnings management.

## Peer review

Peer review under responsibility of College of Management, National Cheng Kung University.

## Conflicts of interest

The authors declared no conflicts of interest.

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