

Does Digital Business Reporting, XBRL, Regulate Financial Reporting Quality in Emerging Market? The Institutional View

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ABSTRACT. This study investigates how real earnings management (REM) and accruals-based earnings management (AEM) as proxies for financial reporting quality are affected by eXtensible business reporting language (XBRL). It seeks to integrate Institutional Theory within the theoretical framework, instead of Agency Theory, the principal theory of management opportunism. It is possible to think of XBRL as the external regulations that influence management's practice toward financial reporting. This study tests the set of suggested hypotheses using regression analysis on a special dataset from Thailand. The results demonstrate a considerable decrease in the practice of earnings management following the deployment of XBRL. Support is given to the notion of Institutional Theory, which holds that an individual's behavior is influenced by their surroundings. Furthermore, this study clarifies the continuing discussion about whether XBRL enhances the quality of financial reporting. Regulators should find this information useful. In particular, the findings complement prior literature in the way that XBRL is beneficial for financial reporting. It sheds lights on the ongoing debate whether XBRL is beneficial for improving the quality of financial reports.

1. Introduction

The development of technology in accounting plays a crucial role in improving financial reporting. Recently, many countries around the globe have implemented the eXtensible Business Reporting Language (XBRL) as a standard computer language for preparing financial reports. However, there are still non-XBRL mandated countries such as New Zealand and Tanzania [1]. Implicitly, it's supposed advantages and unintended consequences remain uncertain. This technology was expected to enhance the accuracy, timeliness, and comparability of financial information with less cost [2]. As such, financial users are expected to find greater value in

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financial statements in this electronic format, and information asymmetry should become less of an issue following XBRL implementation. The empirical evidence published by [3] demonstrated that, when compared to financial information presented in conventional format, information presented in the electronic XBRL format is more pertinent, understandable, and comparable to non-professional investors. Stated differently, XBRL improves, from the standpoint of the user, the qualitative aspects of the financial data given in financial reports. Similarly, accruals-based earnings management (AEM), which happens when managers purposefully manipulate earnings by using improper accounting judgments and estimates in accordance with Generally Accepted Accounting Principles (GAAP), is also unlikely following the implementation of XBRL. This is because AEM is prone to being detected by auditors or regulators [4,5,6]. Although there have been no modifications to accounting standards, managers' incentives to participate in AEM may be reduced by the timely, comparable, and easily accessible financial information provided by the electronic XBRL format [2]. Such evidence emphasizes the advantages of implementing this technology.

On the other hand, some suggest that XBRL implementation can result in some unintended consequences [7,8]. For example, this technology can encourage managers to engage more in real earnings management (REM), which is one of the earnings management options open to them [8]. REM is defined as a deviation from standard practices by distorting operating activities, such as sales manipulation by providing additional discounts, expenditure manipulation by deferring discretionary expenses, and production manipulation by overproducing inventories to reduce costs [9]. In this approach, REM varies from AEM in that AEM is carried out using discretionary accruals permitted by accounting policies, but REM is carried out through operating policies. As a result, REM effects cash flow from operations, whereas AEM does not. Consequently, REM poses a higher risk to firm performance than AEM. However, AEM is easily recognized from irregular discretionary accruals recorded on financial statements, but REM is more difficult to explore [4,10]. Accordingly, the repercussions of XBRL implementation remain uncertain, particularly its actual impact on financial reporting quality and business performance [11,12].

Drawing on the ongoing debate about the effects of XBRL adoption, this study intends to investigate the influence of XBRL implementation on financial reporting quality using data from Thailand. The Department of Business Development (DBD) of the Ministry of Commerce has supported XBRL implementation in Thailand since 2015. This technology has been claimed to help businesses prepare and submit financial reports more easily. Although XBRL has been introduced, empirical study into its impact on the quality of financial reporting in Thailand is limited. From one perspective, XBRL is useful; nonetheless, its unexpected sequences remain contentious. Regulators must therefore take attention of this study, particularly in nations where

XBRL is not yet required or is currently under consideration. According to [13, 14], Thailand represents important structures in emerging countries where ownership concentration and inadequate institutional environments are prominent. Due to inadequate institutions, there is higher information asymmetry and minority expropriation in such a scenario. The quality of financial information has also been questioned in such contexts [15]. XBRL can be viewed as one of the institutional pillars supporting the dissemination of financial information. Therefore, another goal of this research is to broaden the theoretical perspective used for explaining the quality of financial reports as judged by AEM and REM. In general, Agency Theory describes these activities as ones in which self-interest dominates earnings management. However, some suggest that the reporting environment has a significant impact on earnings management decisions [16,17]. This highlights an Institutional Theory viewpoint in which individual players are shaped by institutional features, such as XBRL regulation in this example. The outcomes of this study should contribute to the expanding literature on XBRL implementation and its repercussions.

2. Literature Review and Hypothesis Development

Theoretical Framework

The effect of XBRL implementation on financial reporting quality can be explained by Institutional Theory in the sense that the external environment such as regulations, norms, and culture can shape the behavior of organization actors [18,19]. This theory originated in sociology and has been mainly applied in political studies, where social behavior is a research focus [20]. Essentially, the institutional view proposes that the behavior of social actors is shaped by institutional aspects such as regulative, normative, and cognitive [18]. XBRL adoption is a part of regulations that business organizations need to follow. It has set a transparent atmosphere for financial reporting and such an environment would influence management's motivation to engage or not engage in earnings management [16]. Eventually, the increase (decrease) of earnings management would erode (strengthen) the quality of financial reporting. Thus, Institutional Theory provides a broader view to explain earnings management in comparison to traditional Agency Theory, where the motivation of earnings management is driven by individual self-interest [21]. [21] argued that agency conflicts such as conflict of interest between principals and agents can be exacerbated or diminished by institutional configurations. This argument calls for the extension of theoretical understanding over earnings management by considering the institutional significance. The influence of country-level institutions significantly shapes manager incentives towards financial reporting practice [16]. Therefore, the quality of financial reporting relies not only on the preparer's incentive but it is also subjected to institutional settings [22].

Likewise, [23] introduce a conceptual framework to explain management motivation for accounts manipulation where external regulations mandated by regulators can increase or decrease accounts manipulation. Generally, managers have a low incentive to manipulate accounts in contexts where external regulations set a transparent atmosphere for financial reporting. The practice of earnings management risks detection and punishment in such contexts. Hence, this research applies the institutional lens to explain the effect of XBRL implementation on financial reporting quality measured by earnings management. As mentioned earlier, there are three institutional pillars; regulations, norms, and cultural cognitive under Institutional Theory and these comprise the primary pillars at the country level. XBRL, as the new technological regulation, is likely to control managerial opportunism proposed by Agency Theory. Theoretically, this research responds to the need of theoretical extension from an agency view to an institutional lens [21]. Empirically, additional research is still needed to understand the effect of newly invented technological regulations such as XBRL.

Hypothesis Development

XBRL has been mentioned as a modern technology that sets a new environment for financial reporting and disclosure [11]. Initial jurisdictions that implemented XBRL for financial reporting were the United States and European countries. Recently, this technology has been adopted by many countries around the globe [3]. [24] mentioned that the issue of financial transparency was questionable after the big financial crisis in 2007-2008. The lack of standardized financial information reported in financial reports diminishes its usefulness. This issue leads to the requirement of e-filing where financial data can be systematically prepared and reported by employing a computer language. Such standardized financial information is more understandable and comparable for financial users. As a result, financial transparency can be improved [24]. Considering prior studies, it is argued that the implementation of XBRL technology significantly improves the usefulness of financial information presented in financial reports. [3] revealed that accounting information presented in XBRL format enhances the qualitative characteristics of financial information regarding comparability, relevance, and understandability. In particular, the financial reports with XBRL format offer an interactive form of information and support its usefulness for decision making in terms of future-profit predicting to non-professional users.

Similarly, prior evidence documented by [11] supports the implementation of XBRL technology by revealing that the domestic institutional investors' bias was reduced after the period of XBRL adoption in the US. [11] mentioned that XBRL technology encourages more information disclosure, decreases the cost of information processing, and supports analytical coverage. Overall, this technology of financial reporting is likely to reduce information asymmetry in capital markets. Also, this technology is likely to reduce management

opportunism. The study by [2] uncovered that the practice of accrual-based earnings management measured by the magnitude of abnormally discretionary accruals significantly decreases in the post-XBRL compulsory period. The abovementioned evidence highlights the notion documented in the literature that the implementation of XBRL for financial reporting is beneficial. It improves the reporting environment [25], and then the reporting environment significantly influences management opportunism [16]. Although [8] revealed that the practice of REM had increased after the period of XBRL implementation in China, their sample was comprised of suspect firms. Management in such firms is likely to have a strong incentive for manipulating reported earnings.

It has been documented in the literature that REM is more difficult to detect in comparison to AEM. However, financial reporting in XBRL format allows machine-readable and tracking functions [26]. According to these features, REM can be simply detected as well as AEM. This is because auditors or regulators are able to compare and track individual accounting items reported in financial reports for a specific firm with its peers that operate in the same industry. For example, when a specific firm has an abnormal growth in sales compared to others reported in its historical data while cash flow from operations were abnormally low, such a firm can be suspected of sales manipulation. Hence, XBRL technology supports the comparability and transparency of financial data [3,24]. Building upon Institutional Theory where management's behavior can be shaped by regulations, this research proposes that XBRL technology sets a transparent environment; thus, the practice of earnings management in both AEM and REM would be reduced. As a result, the quality of financial reporting would be better. The set of testable hypotheses is presented as follows.

Hypothesis 1. The practice of AEM decreases after the implementation of XBRL technology.

Hypothesis 2. The practice of REM decreases after the implementation of XBRL technology.

3. Research Methodology

Sample and Data Collection

This research focuses on Thailand which has adopted XBRL since 2015. However, the empirical evidence regarding the effect of XBRL implementation on the quality of financial reports is almost negligible and regulators should be informed about its consequences. Therefore, the context of Thailand allows this research to test the proposed hypotheses. The periods of study were 2013-2016 which allow this research to test the practice of AEM and REM in pre and post XBRL implementation at the beginning phase. The population consisted of companies listed on The Stock Exchange of Thailand (SET). Nevertheless, the observations from the financial industry

were excluded from the sample due to the industry's specific regulations as recommended in the literature [5,27,28]. In particular, counting such an industry into the sample may complicate the interpretation. The initial sample was about 2,830 firm-year observations. However, a lack of necessary variables such as financial variables to calculate AEM and REM or control variables necessitated a reduced the sample size from 2,830 to 1,276 firm-year observations with 1,175 observations for almost model specifications. The archival databases, namely, the S&P Capital IQ were primary sources of data. More specifically, financial data for calculating the earnings management model was mainly retrieved from that database. However, the missing data was complemented by hand collecting, if possible, and the sources of data were financial reports. Continuous variables are winsorized 1% at the top and bottom to address the outliers in dataset following prior literature [28,29]. The winsorizing will mitigate the effect of outliers in regression analysis while the sample size is not reduced.

Variable Measures

Dependent Variable

Financial reporting quality is the phenomenon that was studied as the consequence of XBRL implementation in this research. Judged by prior literature, the practice of earnings management can indicate the quality of financial reporting and earnings management can be proxied by AEM and REM [4,30,31,32,33]. Thus, this research applied the magnitude of earnings management captured by AEM and REM, to represent financial reporting quality where the higher degree of earnings management indicates the lower quality of financial reporting due to the distortion of financial information being reported on financial reports. The models used to measure AEM and REM are discussed below.

Accruals-Based Earnings management

The absolute values of residuals from the Performance-Matched Discretionary Accruals Model are applied in this research to capture AEM [34]. Such a model is well-known and has been significantly used in the literature [10,29,35,36,37]. The Performance-Matched Model controls firm performance and thus reduces the bias in firms with extreme performance. Those firms were mentioned by [38] to negatively influence the power of the accruals model. The model is illustrated below.

$$TA_{it}/A_{it-1} = \alpha_1 (1/A_{it-1}) + \beta_1 (\Delta REV_{it} - \Delta REC_{it}) / A_{it-1} + \beta_2 PPE_{it} / A_{it-1} + \beta_3 ROA_{it-1} + \varepsilon_{it} \quad (1)$$

Where:

TA = Total accruals (computed by net income – cash flow from operations)

A = Lagged Total Assets

ΔREV = Change in revenues

ΔREC = Change in Accounts Receivable

PPE = Gross Properties Plants and Equipment

ROA = Return on Assets Ratio

Real Earnings Management

[9] mentioned that real earnings management or real activities management is one of the earnings management choices that are available to managers. Real earnings management exists when managers manipulate real economic transactions through operating policies not accounting policies to gain the desired earnings amount [9]. Therefore, real earnings management is prevalent in contexts where regulations to govern financial reporting are strict [5,6,39,40]. This research follows the empirical models introduced by [9] where sales manipulation, production manipulation, and discretionary expense manipulation are proxies of real earnings management. The aggregate proxy by summing all individual values is applied in the main test following prior research [10,39,41]. The models are as follows.

$$CFO / At-1 = \alpha_0 + \alpha_1 (1 / At-1) + \beta_1 (St / At-1) + \beta_2 (\Delta St / At-1) + \epsilon_t \dots \dots \dots (2)$$

$$PROD_t / At-1 = \alpha_0 + \alpha_1 (1 / At-1) + \beta_1 (St / At-1) + \beta_2 (\Delta St / At-1) + \beta_3 (\Delta St-1 / At-1) + \epsilon_t \dots \dots \dots (3)$$

$$DISEXP_t / At-1 = \alpha_0 + \alpha_1 (1 / At-1) + \beta_1 (St-1 / At-1) + \epsilon_t \dots \dots \dots (4)$$

Where:

CFO = Cash flow from operations

S = Sales/Revenues

ΔS = Change in Sales/Revenues

PROD = Cost of Goods Sold + change in inventories

DISEXP = Discretionary expenses (Selling, General, and Administrative expenses)

Independent Variable

The implementation of XBRL is treated as an independent variable in this study. This variable is proxied by using a dummy variable in which the value is equal to 1 if the year ≥ 2015 and 0 if otherwise. The year 2015 is used as a threshold because in that year XBRL was first implemented in the context of Thailand.

Control Variable

The primary control variables are added to the model following prior studies. AEM (REM) is the first control variable where REM (AEM) is treated as a dependent variable [39,42]. [42] documented that the level of real earnings management significantly indicates the level of accruals-based earnings management and vice versa. A trade-off between real and accruals earnings management is supported in that case. Therefore, this study controls for the level of

AEM or REM in the Baseline Model. In addition, this study controls for other firm characteristics such as the controlling shareholder (CON), lagged cash flow from operations (Lag_CFO), lagged performance (Lag_ROA), firm leverage (DA), and firm size (Ln_TOA). Such variables, which vary among firms, have been mentioned in the literature to influence the practice of earnings management [2,8,28,35,39,43,44]. The effect of CON is proxied by the percentage of shares held by the largest shareholder [35,41]. Lag_CFO is measured by cash flow from operations deflated by sales following [29,39]. Lag_ROA is the return on assets ratio in the previous year that is applied to capture lagged performance [39]. DA is captured by total liabilities divided by total assets following [39], whereas Ln_TOA is proxied by the natural logarithm of total assets at the year-end [29].

Research Approach

Deductive logic is applied in this research by using the quantitative technique, namely, regression as a primary method to analyze the data. The regression model is illustrated below. Industry and year dummies are also added to the Baseline Model to control for the industrial- and time-heterogeneous effects.

$$AEM_{it} (REM_{it}) = \beta_0 + \beta_1 XBRL_{it} + \beta_2 REM_{it} (AEM_{it}) + \beta_3 CON_{it} + \beta_4 Lag_CFO_{it} + \beta_5 Lag_ROA_{it} + \beta_6 DA_{it} + \beta_7 Ln_TOA_{it} + Industry\ Dummies_k + Year\ Dummies_t + \varepsilon_{it} \dots\dots (Baseline\ Model)$$

4. Research Results

Descriptive Statistics

Table 1 reports descriptive statistics where the characteristics of the dataset are described. The average of AEM, which represents the magnitude of abnormally discretionary accruals, was about 0.077. This value is relatively less in comparison to the level of AEM reported in the study by [28] where Thailand is one of the countries in the dataset and the periods of study are 1995-2016. This is because a different proxy was adopted. The aggregated proxy of AEM, computed by the sum of three individual scores, was applied by [28] while this study relies on individual measures. However, the magnitude of AEM in this study was comparable with the study by [5,37], where Thailand is one of the countries in the sample. On the other hand, the mean of REM was 0.088, which is comparable to values reported in the literature [39]. The means of AEM and REM are relatively higher than its median (see p25 and p75 in Table 1). This can be attributed to the differences in size of firms collected as samples.

In addition, the mean of CON was about 28% indicating that the largest shareholder significantly controlled the firm. This is typical in the literature where ownership structure is concentrated in Thailand and East Asia [13,45,46]. Furthermore, the mean of Lag_CFO was positive (Mean 0.067) which indicates that on average firms in this dataset have net cash inflow

from operating activities. Similarly, the mean of Lag_ROA was positive (Mean 0.049). However, the mean of leverage (DA) was almost 50% of total assets. This ratio is in line with prior literature where banks are still significant sources of funding in Thailand [37]. Finally, the mean of Ln_TOA was 11.537, which is similar to the mean reported by [28].

Table 1 Descriptive Statistics

Variables	Mean	Standard Deviation	p25	p75
AEM	0.077	0.102	0.021	0.096
REM	0.088	0.075	0.031	0.122
CON (%)	27.398	21.549	10.600	38.240
Lag_CFO	0.067	0.213	0.011	0.149
Lag_ROA	0.049	0.095	0.010	0.095
DA	0.456	0.601	0.254	0.600
Ln_TOA	11.537	1.595	10.377	12.444

Correlation Analysis

Table 2 illustrates the correlation coefficients between two variables to initially address the multicollinearity issue where two or more explanatory variables are correlated. This problem will bias regression analysis, and thus hypothesis testing. Prior literature has suggested that correlation coefficients should not be higher than 0.800 [47]. The maximum coefficient among explanatory variables is 0.352, which is acceptable. Thus, multicollinearity is not problematic in this case. In addition, XBRL significantly correlates with AEM and REM as reported in Table 2. Initially, the proposed hypotheses are supported.

Table 2 Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) AEM	1.000							
(2) REM	0.551* (0.000)	1.000						
(3) XBRL	-0.113* (0.000)	-0.105* (0.000)	1.000					
(4) CON	-0.011 (0.674)	0.092* (0.000)	-0.022 (0.319)	1.000				

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(5) Lag_CFO	-0.076* (0.003)	0.001 (0.954)	-0.045* (0.038)	0.078* (0.001)	1.000			
(6) Lag_ROA	-0.079* (0.000)	-0.080* (0.000)	0.023 (0.226)	0.000 (0.993)	0.352* (0.000)	1.000		
(7) DA	0.102* (0.000)	-0.070* (0.000)	0.017 (0.375)	-0.019 (0.400)	-0.068* (0.002)	-0.139* (0.000)	1.000	
(8) Ln_TOA	-0.147* (0.000)	0.065* (0.001)	-0.148* (0.000)	-0.055* (0.015)	0.035 (0.105)	0.070* (0.000)	-0.019 (0.312)	1.000

* shows significance at the 0.05 level

Hypothesis Testing

This research argues that the implementation of XBRL technology for financial reporting would reduce the incentive for accounts manipulation by both AEM and REM as stated in Hypothesis 1 (H1) and Hypothesis 2 (H2). The findings of hypotheses testing are reported in Table 3 in which two models are illustrated. The first model, Model 1, reported that the effect of XBRL implementation on AEM and XBRL was negatively significant at a 5% level (coefficient -0.010, $p < 0.05$). This indicates that the magnitude of AEM in post-XBRL implementation was reduced, and then H1 is accepted. Similarly, the coefficient of XBRL in Model 2 Table 3 is statistically significant (coefficient -0.009, $p < 0.05$), which supported H2. Specifically, the practice of REM is less in post-XBRL implementation.

Additionally, most control variables were significant as reported in Table 3. REM (AEM) was statistically significant in Model 1 (Model 2) Table 3, indicating the complementarity between the two strategies of earnings manipulation [48,49], whereas Lag_CFO had a negative link with AEM but not with REM. This implies that firms with higher cash flow from operation in the previous year are unlikely to employ AEM [29]. On the other hand, Lag_ROA had a positive link with REM. As documented in the literature, REM is detrimental to future performance. Firms with poor performance might not risk their future performance by engaging in REM to boost current earnings but this might not be the case in firms with good performance. The positive link between performance and REM is also documented in the literature [10]. In addition, firms with high leverage (DA) are likely to employ AEM, consistent with debt covenant pressure proposed in the literature [35,39]. Finally, AEM and REM are unlikely in large firms as suggested by the political cost hypothesis. The coefficients of firm size (Ln_TOA) are significant and negative in Model 1 and Model 2 Table 3.

Table 3 The Effect of XBRL Implementation on Accrual-Based and Real Earnings Management

This table demonstrates the effect of XBRL implementation on financial reporting quality measured by AEM and REM. The variable of interest is XBRL. Robust standard errors are used and related robust t-statistics are reported in this case to account for the potential heteroscedasticity.

Variables	Dependent Variables	
	Model 1 AEM	Model 2 REM
XBRL	-0.010** (-2.310)	-0.009** (-2.094)
REM	0.674*** (16.699)	
AEM		0.530*** (17.397)
CON	-0.001 (-0.151)	0.009 (1.097)
Lag_CFO	-0.050*** (-2.742)	0.001 (0.035)
Lag_ROA	-0.005 (-0.136)	0.175*** (4.808)
DA	0.028*** (2.864)	0.010 (0.949)
Ln_TOA	-0.003** (-2.440)	-0.002* (-1.666)
Constant	0.077*** (3.685)	0.044** (2.184)
Industry Dummy	Yes	Yes
Year Dummy	Yes	Yes
The Highest VIF	1.63	1.57
Observations	1,175	1,175
Adjusted R-squared	0.478	0.381

Robust t-statistics in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Robustness Test

Alternative Proxies of Earning Management

This section reports additional tests that were performed to ensure the robustness of the findings reported in the previous section. Alternative proxies of AEM and REM were used and the findings are presented in Table 4. AEM was computed by implementing Modified Jones Model [38] as an alternative proxy of AEM following prior literature [5,50]. The model is similar to the Performance-Matched Discretionary Accruals Model but not adjusting for firm performance. The findings of XBRL in Model 1 Table 4 were negatively significant, supporting the findings reported in the main analysis. Similarly, the findings reported in Model 2 Table 4, where an alternative proxy of REM is applied as the dependent variable, were comparative to the findings reported in Model 2 Table 3. The magnitude of REM was lower in the periods after XBRL adoption. This research particularly applied the aggregate of sales manipulation and discretionary expenses manipulation as an alternative proxy of REM following prior research [32,51]. [32] argue that sales manipulation and production manipulation reduce cash flow from operations and summarizing them together may induce double counting. Therefore, this research excluded production manipulation in calculating alternative proxy of REM. In conclusion, alternative proxies of earnings management did not alter the findings reported in the main analysis.

Table 4 The Effect of XBRL Implementation on Accrual-Based Earnings Management and Real Earnings Management by Using Alternative Proxies

This table reports the link between XBRL implementation and alternative proxies of earnings management.

Variables	Model 1 AEM_2	Model2 REM_2
XBRL	-0.022*** (-3.454)	-0.013* (-1.956)
REM	0.234*** (5.399)	
AEM		0.682*** (13.904)
CON	0.022** (2.041)	0.002 (0.156)
Lag_CFO	-0.185*** (-5.173)	0.004 (0.139)
Lag_ROA	0.119** (2.096)	0.291*** (5.840)
DA	0.061*** (4.913)	0.019 (1.267)
Ln_TOA	-0.007*** (-4.421)	-0.009*** (-4.298)
Constant	0.134*** (5.618)	0.174*** (4.915)
Industry Dummy	Yes	Yes
Year Dummy	Yes	Yes
The Highest VIF	1.63	1.57
Observations	1,276	1,175
Adjusted R-squared	0.238	0.359

Robust t-statistics in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

5. Discussion and Conclusion

This research investigated the effect of XBRL implementation on the quality of financial reporting. XBRL has been implemented in many countries around the globe for financial reporting purposes. This electronic technology was introduced to improve the accuracy, timeliness, and comparability of financial information with lower costs. Hence, regulators encourage the adoption of this technology while the actual consequences of XBRL implementation are still questionable. However, the findings in this research support the regulators' view that XBRL is introduced and implemented for improving the quality of financial reporting. Specifically, this research documented that the levels of AEM and REM were lower in post-XBRL implementation. The findings are in line with prior research that supports the advantage of this electronic technology for financial reporting [2,3]. Additionally, the findings are robust as demonstrated when additional tests were performed.

To conclude, XBRL sets a transparent environment for financial reporting that influences management behavior towards earnings management practice. The view of Institutional Theory is supported in this case where the behavior of organizational actors can be directed by the external environment. As mentioned in the literature, coercive pressure through the regulatory pillar is important in emerging countries to enforce firms adopting XBRL [53]. Implicitly, this technological regulation may be needed in the contexts with other regulatory enforcement such as rule of law or investor protection. Thus, this research complements prior literature and contributes additional insights to XBRL and financial reporting literature in a way that electronic financial reporting can set a transparent environment and reduces the incentive for engaging in earnings manipulation. Consequently, opportunistic behavior is attenuated after-XBRL adoption. The financial reporting environment is vital as proposed by Institutional theory to direct individual behavior. Theoretically, this research responds to the gap in existing literature where Agency Theory needs to be extended by complimenting it with Institutional Theory [21,52] to better understand individual behavior. Also, the findings support the view of regulators, whose responsibility is to arrange and encourage the implementation of XBRL, in a way that XBRL should be implemented for improving financial reporting. This underlines its practical implementation.

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References

- [1] V. Tawiah, H. Borgi, Impact of Xbrl Adoption on Financial Reporting Quality: A Global Evidence, *Account. Res. J.* 35 (2022), 815-833. <https://doi.org/10.1108/arj-01-2022-0002>.
- [2] J. Kim, J.W. Kim, J. Lim, Does XBRL Adoption Constrain Earnings Management? Early Evidence from Mandated U.S. Filers, *Contemp. Account. Res.* 36 (2019), 2610-2634. <https://doi.org/10.1111/1911-3846.12493>.
- [3] J.L. Birt, K. Muthusamy, P. Bir, Xbrl and the Qualitative Characteristics of Useful Financial Information, *Account. Res. J.* 30 (2017), 107-126. <https://doi.org/10.1108/arj-11-2014-0105>.
- [4] M. Enomoto, F. Kimura, T. Yamaguchi, Accrual-based and Real Earnings Management: An International Comparison for Investor Protection, *J. Contemp. Account. Econ.* 11 (2015), 183-198. <https://doi.org/10.1016/j.jcae.2015.07.001>.
- [5] B. Francis, I. Hasan, L. Li, A Cross-Country Study of Legal-System Strength and Real Earnings Management, *J. Account. Public Polic.* 35 (2016), 477-512. <https://doi.org/10.1016/j.jaccpubpol.2016.06.004>.
- [6] S.P. Kothari, N. Mizik, S. Roychowdhury, Managing for the Moment: The Role of Earnings Management via Real Activities Versus Accruals in SEO Valuation, *Account. Rev.* 91 (2015), 559-586. <https://doi.org/10.2308/accr-51153>.
- [7] J.E. Boritz, W.G. No, The SEC'S XBRL Voluntary Filing Program on Edgar: A Case for Quality Assurance, *Curr. Issues Audit.* 2 (2008), A36-A50. <https://doi.org/10.2308/ciia.2008.2.2.a36>.
- [8] S. Chen, J. Guo, Q. Liu, X. Tong, The Impact of Xbrl on Real Earnings Management: Unexpected Consequences of the Xbrl Implementation in China, *Rev. Quant. Financ. Account.* 56 (2020), 479-504. <https://doi.org/10.1007/s11156-020-00900-1>.
- [9] S. Roychowdhury, Earnings Management through Real Activities Manipulation, *J. Account. Econ.* 42 (2006), 335-370. <https://doi.org/10.1016/j.jacceco.2006.01.002>.
- [10] G. Braam, M. Nandy, U. Weitzel, S. Lodh, Accrual-based and Real Earnings Management and Political Connections, *Int. J. Account.* 50 (2015), 111-141. <https://doi.org/10.1016/j.intacc.2013.10.009>.
- [11] B. Li, Z. Liu, W. Qiang, B. Zhang, The Impact of XBRL Adoption on Local Bias: Evidence from Mandated U.S. Filers, *J. Account. Public Polic.* 39 (2020), 106767. <https://doi.org/10.1016/j.jaccpubpol.2020.106767>.
- [12] C. Liu, T. Wang, L.J. Yao, XBRL's Impact on Analyst Forecast Behavior: An Empirical Study, *J. Account. Public Polic.* 33 (2014), 69-82. <https://doi.org/10.1016/j.jaccpubpol.2013.10.004>.
- [13] J.T. Connelly, P. Limpaphayom, N.J. Nagarajan, Form Versus Substance: The Effect of Ownership Structure and Corporate Governance on Firm Value in Thailand, *J. Bank. Financ.* 36 (2012), 1722-1743. <https://doi.org/10.1016/j.jbankfin.2012.01.017>.
- [14] R. La Porta, F. Lopez-de-Silanes, A. Shleifer, R. Vishny, Investor Protection and Corporate Governance, *J. Financ. Econ.* 58 (2000), 3-27. [https://doi.org/10.1016/s0304-405x\(00\)00065-9](https://doi.org/10.1016/s0304-405x(00)00065-9).
- [15] S. Wuttichindanon, P. Issarawornrawanich, Determining Factors of Key Audit Matter Disclosure in Thailand, *Pac. Account. Rev.* 32 (2020), 563-584. <https://doi.org/10.1108/par-01-2020-0004>.

- [16] M.E. Evans, R.W. Houston, M.F. Peters, J.H. Pratt, Reporting Regulatory Environments and Earnings Management: U.S. and Non-U.S. Firms Using U.S. GAAP or IFRS, *Account. Rev.* 90 (2014), 1969-1994. <https://doi.org/10.2308/accr-51008>.
- [17] R. Ewert, A. Wagenhofer, Economic Effects of Tightening Accounting Standards to Restrict Earnings Management, *Account. Rev.* 80 (2005), 1101-1124. <https://doi.org/10.2308/accr.2005.80.4.1101>.
- [18] W.R. Scott, The Adolescence of Institutional Theory, *Adm. Sci. Q.* 32 (1987), 493-511. <https://doi.org/10.2307/2392880>.
- [19] P. Wysocki, New Institutional Accounting and IFRS, *Account. Bus. Res.* 41 (2011), 309-328. <https://doi.org/10.1080/00014788.2011.575298>.
- [20] J. Moll, J. Burns, M. Major, Institutional Theory in Accounting Research, in: Z. Hoque (Ed.), *Methodological Issues in Accounting Research*, Spiramus Press, (2018).
- [21] K.W. Kury, Decoupled Earnings: An Institutional Perspective of the Consequences of Maximizing Shareholder Value, *Account. Forum* 31 (2007), 370-383. <https://doi.org/10.1016/j.accfor.2007.09.003>.
- [22] R. Ball, A. Robin, J.S. Wu, Incentives Versus Standards: Properties of Accounting Income in Four East Asian Countries, *J. Account. Econ.* 36 (2003), 235-270. <https://doi.org/10.1016/j.jacceco.2003.10.003>.
- [23] H. Stolowy, G. Breton, Accounts Manipulation: A Literature Review and Proposed Conceptual Framework, *Rev. Account. Financ.* 3 (2004), 5-92. <https://doi.org/10.1108/eb043395>.
- [24] Y. Chen, Improving Transparency in the Financial Sector, *Public Perform. Manag. Rev.* 37 (2013), 241-262. <https://doi.org/10.2753/pmr1530-9576370203>.
- [25] Z. Bai, M. Sakaue, F. Takeda, The Impact of XBRL Adoption on The Information Environment: Evidence From Japan, *Jpn. Account. Rev.* 4 (2014), 49-74. <https://doi.org/10.11640/tjar.4.2014.03>.
- [26] Y. Dong, O.Z. Li, Y. Lin, C. Ni, Does Information-Processing Cost Affect Firm-Specific Information Acquisition? Evidence from XBRL Adoption, *J. Financ. Quant. Anal.* 51 (2016), 435-462. <https://doi.org/10.1017/s0022109016000235>.
- [27] M. Enomoto, F. Kimura, T. Yamaguchi, A Cross-country Study on the Relationship Between Financial Development and Earnings Management, *J. Int. Financ. Manag. Account.* 29 (2017), 166-194. <https://doi.org/10.1111/jifm.12078>.
- [28] T.T. Lemma, M. Negash, M. Mlilo, A. Lulseged, Institutional Ownership, Product Market Competition, and Earnings Management: Some Evidence from International Data, *J. Bus. Res.* 90 (2018), 151-163. <https://doi.org/10.1016/j.jbusres.2018.04.035>.
- [29] J. Kim, Y. Kim, J. Zhou, Languages and Earnings Management, *J. Account. Econ.* 63 (2017), 288-306. <https://doi.org/10.1016/j.jacceco.2017.04.001>.
- [30] M. Alhadab, I. Clacher, K. Keasey, A Comparative Analysis of Real and Accrual Earnings Management Around Initial Public Offerings Under Different Regulatory Environments, *J. Bus. Financ. Account.* 43 (2016), 849-871. <https://doi.org/10.1111/jbfa.12201>.
- [31] M. Alhadab, T. Nguyen, Corporate Diversification and Accrual and Real Earnings Management, *Rev. Account. Financ.* 17 (2018), 198-214. <https://doi.org/10.1108/raf-06-2016-0098>.
- [32] D.A. Cohen, P. Zarowin, Accrual-based and Real Earnings Management Activities Around Seasoned Equity Offerings, *J. Account. Econ.* 50 (2010), 2-19. <https://doi.org/10.1016/j.jacceco.2010.01.002>.

- [33] A.C. Ferentinou, S.C. Anagnostopoulou, Accrual-based and Real Earnings Management Before and After IFRS Adoption, *J. Appl. Account. Res.* 17 (2016), 2-23. <https://doi.org/10.1108/jaar-01-2014-0009>.
- [34] S. Kothari, A.J. Leone, C.E. Wasley, Performance Matched Discretionary Accrual Measures, *J. Account. Econ.* 39 (2005), 163-197. <https://doi.org/10.1016/j.jacceco.2004.11.002>.
- [35] S.R. Bao, K.B. Lewellyn, Ownership Structure and Earnings Management in Emerging Markets – An Institutionalized Agency Perspective, *Int. Bus. Rev.* 26 (2017), 828-838. <https://doi.org/10.1016/j.ibusrev.2017.02.002>.
- [36] M. Hessayri, M. Saihi, Monitoring Earnings Management in Emerging Markets, *J. Econ. Adm. Sci.* 31 (2015), 86-108. <https://doi.org/10.1108/jeas-11-2014-0029>.
- [37] A. Rahman, J. Yammeesri, H. Perera, Financial Reporting Quality in International Settings: A Comparative Study of the USA, Japan, Thailand, France and Germany, *Int. J. Account.* 45 (2010), 1-34. <https://doi.org/10.1016/j.intacc.2010.01.001>.
- [38] P.M. Dechow, R.G. Sloan, A.P. Sweeney, Detecting Earnings Management, *Account. Rev.* 70 (1995), 193-225. <https://www.jstor.org/stable/248303>.
- [39] A. Choi, J. Choi, B.C. Sohn, The Joint Effect of Audit Quality and Legal Regimes on the Use of Real Earnings Management: International Evidence, *Contemp. Account. Res.* 35 (2018), 2225-2257. <https://doi.org/10.1111/1911-3846.12370>.
- [40] J. Preiato, P. Brown, A. Tarca, A Comparison of Between-Country Measures of Legal Setting and Enforcement of Accounting Standards, *J. Bus. Financ. Account.* 42 (2015), 1-50. <https://doi.org/10.1111/jbfa.12112>.
- [41] A. Achleitner, N. Günther, C. Kaserer, G. Siciliano, Real Earnings Management and Accrual-Based Earnings Management in Family Firms, *Eur. Account. Rev.* 23 (2014), 431-461. <https://doi.org/10.1080/09638180.2014.895620>.
- [42] A.Y. Zang, Evidence on the Trade-Off Between Real Activities Manipulation and Accrual-Based Earnings Management, *Account. Rev.* 87 (2011), 675-703. <https://doi.org/10.2308/accr-10196>.
- [43] J. Guo, P. Huang, Y. Zhang, N. Zhou, Foreign Ownership and Real Earnings Management: Evidence From Japan, *J. Int. Account. Res.* 14 (2015), 185-213. <https://doi.org/10.2308/jiar-51274>.
- [44] I.O. Oz, T. Yelkenci, Examination of Real and Accrual Earnings Management: A Cross-Country Analysis of Legal Origin Under IFRS, *Int. Rev. Financ. Anal.* 58 (2018), 24-37. <https://doi.org/10.1016/j.irfa.2018.04.003>.
- [45] T.Q. Dinh, A. Calabrò, Asian Family Firms Through Corporate Governance and Institutions: A Systematic Review of the Literature and Agenda for Future Research, *Int. J. Manag. Rev.* 21 (2018), 50-75. <https://doi.org/10.1111/ijmr.12176>.
- [46] J.P. Fan, T. Wong, Corporate Ownership Structure and the Informativeness of Accounting Earnings in East Asia, *J. Account. Econ.* 33 (2002), 401-425. [https://doi.org/10.1016/s0165-4101\(02\)00047-2](https://doi.org/10.1016/s0165-4101(02)00047-2).
- [47] J.F. Hair, ed., *Multivariate Data Analysis*, Pearson/Prentice Hall, Upper Saddle River, 2006.
- [48] L. Li, Is There a Trade-Off Between Accrual-Based and Real Earnings Management? Evidence from Equity Compensation and Market Pricing, *Financ. Res. Lett.* 28 (2019), 191-197. <https://doi.org/10.1016/j.frl.2018.04.021>.

- [49] M. Sellami, The Interaction Between Real and Accrual-Based Earnings Management: Analysis Based on the Mandatory Ifrs Adoption, *Int. J. Account. Econ. Stud.* 4 (2016), 24.
<https://doi.org/10.14419/ijaes.v4i1.5721>.
- [50] S.C. Anagnostopoulou, Accounting Quality and Loan Pricing: The Effect of Cross-Country Differences in Legal Enforcement, *Int. J. Account.* 52 (2017), 178-200. <https://doi.org/10.1016/j.intacc.2016.11.001>.
- [51] E. Ipino, A. Parbonetti, Mandatory Ifrs Adoption: The Trade-Off Between Accrual-Based and Real Earnings Management, *Account. Bus. Res.* 47 (2016), 91-121.
<https://doi.org/10.1080/00014788.2016.1238293>.
- [52] J. Oehmichen, East Meets West—Corporate Governance in Asian Emerging Markets: A Literature Review and Research Agenda, *Int. Bus. Rev.* 27 (2018), 465-480.
<https://doi.org/10.1016/j.ibusrev.2017.09.013>.
- [53] H. Borgi, V. Tawiah, Determinants of Extensible Business Reporting Language Adoption: An Institutional Perspective, *Int. J. Account. Inf. Manag.* 30 (2022), 352-371.
<https://doi.org/10.1108/ijaim-11-2021-0242>.