The Indonesian Accounting Review Vol. 12, No. 1, January - June 2022, pages 59 - 72

Digitalization of Financial Reporting Through XBRL and the Cost of Equity

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ARTICLE INFO

Article history
Received 1 June 2021
Revised 23 November 2021
Accepted 25 November 2021

JEL Classification:
M41

Key words:
Cost of Equity,
XBRL,
Information Processing Cost,
Qualitative Characteristics of Accounting Information

DOI:
10.14414/tiar.v12i1.2576

ABSTRACT

This study aims to explore the relation between the pre and post adoption of the Extensible Business Reporting Language (XBRL) adoption and the cost of equity capital in Indonesian-listed firms. The study examines 59 listed companies for four years, including two years before (2014-2015) and two years after (2016-2017) the adoption of XBRL in Indonesia. By comparing the pre and post adoption periods, the multiple regression analysis results will provide valuable information for the related stakeholders of the Indonesia Stock Exchange (IDX). Furthermore, this paper examines the impact of the control variables, such as the firm's size, leverage, vari-ability of return, and price-to-book ratio to the relationship between XBRL and cost of equity (COE). The results show that XBRL adoption is significant in reducing the cost of equity and large-sized firms are more likely to enjoy greater reduction. This paper contributes to the research area by providing evidence on the relationship between XBRL adoption and COE in Indonesia that have mixed results in various countries and environments.

ABSTRAK

Penelitian ini bertujuan untuk mengeksplorasi hubungan antara sebelum dan sesudah Extensible Business Reporting Language (XBRL) dan biaya ekuitas pada perusahaan terbuka di Indonesia. Studi ini meneliti 59 emiten selama empat tahun, termasuk dua tahun sebelum (2014-2015) dan dua tahun setelah (2016-2017) adopsi XBRL di Indonesia. Analisis dilakukan dengan membandingkan periode pra dan pasca-adopsi melalui regresi berganda. Hasil analisis member informasi yang berharga bagi pemangku kepentingan dan pengguna laporan keuangan yang terdaftar di IDX. Selanjutnya, penelitian ini membahas dampak variabel kontrol, seperti ukuran perusahaan, leverage, variabilitas pengembalian, dan rasio harga ke buku terhadap hubungan antara XBRL dan biaya ekuitas (COE). Hasilnya menunjukkan bahwa adopsi XBRL signifikan dalam mengurangi biaya ekuitas dan perusahaan berukuran besar lebih cenderung menikmati pengurangan biaya ekuitas yang lebih besar. Tulisan ini berkontribusi pada bidang penelitian dengan memberikan bukti-bukti tentang hubungan antaraadopsi XBRL dan COE di Indonesia yang memiliki hasil yang beragam di berbagai negara dan lingkungan.

1. INTRODUCTION

Over decades, users of traditional financial reporting have encountered common problems during the preparation, analysis, and communication of financial data. Traditionally, preparers of financial statements report the data using common formats, such as PDF, TEXT, and XLS (Janvrin et al., 2013). According to the Indonesia Stock Exchange (IDX), these problems include data inaccuracy, difficulties in converting and extracting a large amount of data, low comparability of data, and the lack of flexibility in filling the report and presentation (*Indonesia Stock Exchange (IDX) Taxonomy 2014 Guidebook*, 2014). The main cause that leads to these problems is the different forms of financial reports. The Extensible Business Reporting Language (XBRL) is designed to solve these

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problems through a standardized format of reporting. The format is expected to improve the reporting process as well as enhance the reporting quality. Using the format, any user can easily access the data, analyse it with consistency, and enhance the communication of business data. Aside from reducing errors through the digitalization of the reporting, past studies found that the reporting quality is improved as well (Birt et al., 2017). In this paper, the reporting quality refers to the qualitative characteristics of accounting information.

Indonesia is still considered as an early adopter as XBRL was initiated in 2015. During the initial period of adoption, there were many errors and investors were uncertain about the benefits of the format as evident from the studies in the US and China (Dhole et al., 2015; Liu et al., 2014). These studies were conducted on early adoption periods and found that XBRL leads to negative impacts instead of fulfilling the purpose of the format. It will be interesting to test on Indonesian listed firms as the outcome could be different with past research that was conducted on countries with different business environments and characteristics of investors. This is based on the contingency theory which postulates that the benefits of an innovation and technology differ from one institution, environment, as well as one country to another (J. Lee & Miller, 1996; Souitaris, 1999; Szász et al., 2020). Furthermore, the decision to mandate the adoption of XBRL without offering the voluntary filing program leads to an issue based on the study by Zamroni and Aryani (2018). The study suggests that the mandatory filing program was rushed and believes that Indonesia was supposed to experiment with XBRL beforehand. This has raised concerns surrounding the difficulties in maximizing the usefulness of XBRL. Hence, it is reasonable to predict that the cost of equity (COE) in Indonesia has increased after the adoption of XBRL.

The increase in COE can be explained through three ways: errors and inconsistencies, reduced reporting quality, and the increase of transaction cost (Blankespoor, 2012; S. Chen et al., 2015; Dhole et al., 2015; Liu et al., 2014). First, errors and inconsistencies caused the increase of uncertainty for investors as information is not reliable. In this way, they would require a higher rate of return for the risks they are taking. This leads to the second factor that affects the increase of cost of equity. The reporting quality is reduced because of the extensions to taxonomy as well as errors in the format. The last factor is the increase of information processing costs (transaction cost) which influence the cost of equity. It is important for investors to maximize the processing of information in order to evaluate the firm's value. When the information becomes more transparent, they are able to improve understanding of companies' choice of financial reporting. However, if the report is unreliable and lacking the relevance and comparability of information, it becomes expensive to process the information. Hence, increasing the uncertainty as well as cost of equity.

Even though this study expects that XBRL in-creases firms' cost of equity, this paper does not suggest that XBRL is inappropriate for businesses to use. This study rather intends to show how the adoption of XBRL can be improved in order to reduce the COE. The authors believe that the format may eventually reduce COE with the proper regulations and more support from the public.

As the implementation of XBRL minimizes errors and increases the reporting quality, it becomes an in-teresting question whether the format helps to reduce COE. However, through the perspective that transpar-ency of reporting is increased, past studies found evi-dence that COE is reduced (Bai et al., 2014; S. Chen et al., 2015; Kim et al., 2012; O. Z. Li et al., 2012; Yoon et al., 2011).However, there are studies that found different results(Blankespoor, 2012; Liu et al., 2014). Hence, despite the vast research in this area of study, it is un-clear whether adopters are able to realize the actual benefits of implementing XBRL. This paper contributes to this research area by providing evidence on the rela-tionship between XBRL adoption and COE in Indonesia which was derived from the mixed results which occurred in various environments.

2. THEORITICAL FRAMEWORK AND HYPOTHESIS

The relationship between XBRL adoption and the cost of equity is still empirically ambiguous as there are different findings. Past studies (Bai et al., 2014; S. Chen et al., 2015; Kim et al., 2012; O. Z. Li et al., 2012; Yoon et al., 2011) concluded that the cost of equity was reduced after the adoption of XBRL. On the other hand, Blank-espoor (2012) and Liu et al., (2014) found that the adop-tion of XBRL increases the cost of equity. Although both studies by Liu et al.

(2014) and Chen et al. (2014)were conducted in the Chinese stock market, there is a time difference in the data used. Liu et al. (2014) collected the data from 2004 to 2006, which is the initial adoption period of XBRL in China. While Chen et al. (2015) focused more on the cost of equity in 2008 to 2009 which is long after the early adoption period. Most of the past studies that concluded the increase of cost of equity were performed during the early adoption period.

Liu et al. (2014), argued that there are limitations to the format that prevent its usefulness in reducing the cost of equity. Many past studies explained the relationship between XBRL adoption and the cost of equity with different theories. One of the common factors to reduce the cost of equity that previous research expected is information asymmetry (Hao et al., 2014). This is inconsistent with the finding of Chen et al. (2015) that stated the relationship between information asymmetry and the cost of equity is insignificant. The study further concluded that through XBRL, larger companies are more significant in reducing the cost of equity than smaller-sized companies (Hao et al., 2014). This finding is supported by Chen et al. (2015), who also found that lower-risked companies are more likely to enjoy a lower cost of equity. However, this is inconsistent with O. Z. Li et al. (2012), who argued that XBRL adoption is more effective for smaller-sized firms in reducing the cost of equity. Larger firms are expected to show more disclosures and have better management. Thus,they are less risky than smaller firms(Embong et al., 2012).

Since XBRL adoption in Indonesia is still consid-ered to be in the initial period, the research by Liu et al. (2014) is a better fit for this paper as compared to the study by Chen et al. (2014). Despite many studies which concluded that XBRL adoption reduces the cost of equity, this research expects that early adopters of XBRL are more likely to increase the cost of equity. Most studies that found an opposite result from the main benefits of XBRL were conducted during the early adoption period as well. One of the reasons includes the decrease in transparency of the report due to errors which lead to uncertainty and a decline in the qualita-tive characteristics. In the reporting quality section, the findings by Birt et al. (2017) are the expected benefits rather than realizing the actual value of XBRL. Taxon-omy extensions and errors reduce the qualitative char-acteristics, in particular the comparability and relevance of information. The decrease in reporting quality increases the risks for investors as they only have limited information to assess the firm value. Another factor that increases the cost of equity is the increase of information-processing cost which is based on the transaction cost theory. It is notable that investors need to process the utmost information to evaluate a firm value and reduce uncertainty. However, errors and poor reporting quality increases the costs to process information. Thus, the format does not enhance infor-mation processing for investors. In addition, smaller firms in terms of the size have more risks and uncer-tainties than larger firms, thus, increasing the cost of equity. Overall, this paper hypothesizes that the increase in uncertainty about XBRL adoption increases the cost of equity.

H1: The adoption of XBRL increases the cost of equity capital.

3. RESEARCH METHOD

The philosophy of realism was the most suitable to this study, in which the predicted outcome contradicted the common belief of this research area. This study tended to rely more on realism than positivism as the expectation of adopting XBRL was a reduction of the cost of equity capital, unlike the first hypothesis of this paper. The development of the hypotheses and statistical testing in this study indicated the deductive approach. This study used mono methods and specifically, quantitative methods. This research was characterized as a longitudinal study as it compared the cost of equity in two periods of time which were three years before and three years after the adoption obtained from the secondary data from Indonesian publicly listed firms.

For the hypothesis testing, this research will be using the descriptive statistics to ensure that the data do not contain extreme values. Then, this paper will be using the correlation formula to find the relationship between variables. It is important to discover the positive or negative relationship between each variable before deciding on the results. The study will also include a multicollinearity test. Furthermore, multiple regression analyses will be used to analyse the data as it is known to be one of the most promising tools for a fair measurement. This type of regression is best fit for the research model and data because it consists of two dummy variables.

Furthermore, even though it is mandatory for all listed firms in IDX to report the PDF and XBRL formats, it is notable that there are companies whose reports are not available to the public. Hence, the authors excluded the firms with no submission of the XBRL report during the research periods.

It is important to ensure that these companies have the XBRL report in 2016 as well as 2017 to obtain a consistent and correct result. Considering the mentioned criteria of samples to be tested, at the end, the study examined 59 listed companies per year for four years, including two years before (2014-2015) and two years after (2016-2017) the adoption of XBRL in Indonesia. XBRL adoption was mandated in August 2015 and during that time, XBRL filings were not publicly available yet until early 2016. The overall firm-year observations are 236.

The research model of this paper was developed from prior studies of S. Li (2010) and Liu et al. (2014). S. Li (2010) conducted a study of IFRS adoption and its impact to the cost of equity in European countries. The research model included variables that represented the financial information and risks of firms that were best suited for the cost of equity, while Liu et al. (2014), investigated the impact of XBRL adoption to the cost of equity and transaction cost in China. The independent variable to measure the pre- and post- adoption period in this research was influenced by the model of Liu et al. (2014).

The other variables in the model are control variables that represent the financial and risks aspect of the firms that are associated with cross-sectional variation of the returns (Fama & French 1992, 1993; Li, 2010) as well as dummy variables representing the different industry sectors of firms selected in the sample.

Hence, based on these prior studies, the model included a dependent variable which was the firms' cost of equity, a dummy variable for the pre- and post- adoption period of XBRL, and controlling variables to determine firms' financial and risk aspects.

$$\begin{aligned} CoEit = \; & a_0 + a_1 XBRLENV_{it} + a_2 SIZE_{it} + a_3 LEV_{it} \\ & + a_4 RETVAR_{it} + a_5 MB_{it} \\ & + a_6 INDSTR\_AGRI_{it} \\ & + a_7 INDSTR\_BASIC_{it} \\ & + a_8 INDSTR\_CONS_{it} \\ & + a_9 INDSTR\_INFRA_{it} \\ & + a_{10} INDSTR\_MIN_{it} \\ & + a_{11} INDSTR\_MISCE_{it} \\ & + a_{12} INDSTR\_PROP_{it} \\ & + a_{13} INDSTR\_TRADE_{it} + \varepsilon_{it} \end{aligned}$$

Where the cost of equity capital is based on the price/earnings growth (PEG) ratio. According to Botosan and Plumlee (2005), the PEG ratio is the best method to represent the cost of equity as it is consistently and predictably associated with risk. In the research model, CoE is a dependent variable that may increase or decrease depending on the independent variables of the equation. The formula of the PEG ratio that was used in this paper was slightly different from past literature. The formula by Liu et al. (2014) and S. Li (2010) used forecasted EPS, while this study applied a historical EPS.

$$PEGRatio = \sqrt{\frac{(eps_2 - eps_1)}{P_0}}$$

XBRL ENVit = A dummy variable which indicates 1 to represent the period after the mandatory adoption of XBRL and 0 for the period before the adoption (Liu et al., 2014). It is the only independent variable in this model.

Table 1
Industry Classification of Sample Firms

Industry	Variable	No. of Firms
Agriculture	INDSTR_AGR	6
Basic Industry & Chemicals	INDSTR_BASIC	6
Consumer Goods	INDSTR_CONS	9
Infrastructure, Utilities, & Transportation	INDSTR_INFRA	8
Mining	INDSTR_MIN	7
Miscellaneous	INDSTR_MIS	6
Property, Real Estate, & Building Construction	INDSTR_PROPE	7
Trade, Service & Investment	INDSTR_TRADE	10

Source: Data Processing

The other variables in the model are control variables that represent the financial and risk aspects of the firms that are associated with cross-sectional variation of the returns (Fama & French, 1992, 1993; S. Li, 2010).

$SIZE_{it}$ = The size of a firm is represented using the natural logarithm of total assets at year-end (S. Li, 2010; Liu et al., 2014). The word Post means this study wants to find out whether the sizes of firmsaffect the relationship between XBRL adoption and the cost of equity. Hao et al. (2014) and Chen et al. (2014), predicted that smaller-sized firms are more likely to affect the positive relationship between XBRL adoption and the cost of equity.

LEV_{it} = Financial leverage based on total liabilities/total assets at year-end (Liu et al., 2014). Leverage indicates the amount of debt a firm uses to finance its assets (Corporate Finance Institute, n.d.). It can also be interpreted as the ability of a firm to pay its debts. A high leverage means the firm has more debt than assets. Many assume that when a firm has more debts than assets, it will struggle to repay its obligations. Hence, high-leveraged firms are more likely to be riskier investments than low-leveraged firms as they may indicate financial distress (Liu et al., 2014; Dhaliwal et al., 2006; S. Li, 2010; O. Z. Li et al., 2012).

$RETVAR_{it}$ = The return variability represents the annual standard deviation of monthly stock returns at year-end (S. Li, 2010; Liu et al., 2014). Standard deviation indicates how much the actual return deviates from the expected normal return. Higher standard deviation shows a larger difference between the return and the expected normal returns. This variable will provide insights on whether an inconsistent return increases the risks for investors, thus, increasing the cost of equity.

MB_{it} = Market-to-book ratio is calculated by dividing the market value from book value. The market value is obtained from the current stock price of all outstanding shares. While the book value is the net assets of the company which can be found in the balance sheet (Corporate Finance Institute, n.d.). This ratio helps to see the value of a firm. A low market-to-book ratio means that the stock is undervalued, and a high ratio indicates that the stock is overvalued. Undervalued stocks have higher risks as they have higher potential growth earnings than overvalued stocks.

$INDSTR\_AGRI_{it}$ = This dummy variable signifies 1 as the firms in the agriculture industry and 0 for other sectors used in the sample. This industry is further divided into five sectors, such as: crops; plantations; animal husbandry; fishery; and forestry (IDX, 2018). It is expected that the agriculture industry will increase the cost of equity as it faces many uncertainties in terms of growth and income wise. One of the main concerns is the production risk surrounding the uncertainties affecting the quantity and quality of the commodities produced, such as the natural growth of crops and livestock, weather, diseases and pests (United States Department of Agriculture, 2020). Moreover, the data reported by Andirerei (2019), shows that agricultural stock prices have inconsistent growth throughout the years. In 2015, agriculture stock prices declined by 27%, higher than the Indonesia Stock Exchange which declined by 12%. This makes investors uncertain about the future of this industry; thus, there is an expected high cost of equity.

$INDSTR\_BASIC_{it}$ = This dummy variable represents firms in the basic industry and chemicals sector as 1, while other sectors stand for 0. This industry includes eight different subsectors: cement; ceramics, glass, and porcelain; metal and allied products; chemicals; plastics and packaging; animal feed; wood industries; and pulp and paper (IDX, 2018). This industry is expected to increase the cost of equity as the demand declined in 2015. Firms in the basic industry and chemicals sector are closely related to the property, real estate, and building construction industry, especially the subsector of cement and ceramics. In 2015, INDSTR_PROP encountered a decline in growth by 32.31% from 2014 which helps to explain a lower demand for INDSTR_BASIC (tempo.co, 2015).

$INDSTR\_CONS_{it}$ = This variable represents firms in the consumer goods industry which is further divided into five subsectors: food and beverages; tobacco manufacturers; pharmaceuticals; cosmetics and household; and houseware (IDX, 2018). The consumer goods industry has the highest market capitalization in this sample. The consumer goods industry is expected to reduce CoE as the number of middle-income households is projected to double by the end of 2020, and the purchasing power of the buyers will increase as well (Cekindo, n.d.; Indonesia Investments, 2018). The consumer goods sector has the potential to be one of the leading industries in the upcoming years which makes it an attractive investment to investors, thus, reducing the

cost of equity. One of the major subsectors in the consumer goods industry iscosmetics as well as food and beverages. For instance, the cosmetics industry enjoyed a 12% growth in sales in 2017 (Cekindo, n.d.).

$INDSTR\_INFRA_{it}$ = This dummy variable represents the firms in the infrastructure, transportation, and utilities industry which includes seven subsectors: energy; transportation; toll road, airport, harbour, and allied production; telecommunication; and non-building construction (IDX, 2018). 0 stands for sectors aside from this industry, and 1 is for firms in the infrastructure, transportation andutilities industry. This industry is projected to reduce the cost of equity as it has a positive outlook in the future, since the Indonesian government has a plan to improve the infra-structure in Indonesia. From 2015 to 2019, Jokowi funded $10 billion each year to fulfil the plan (PwC Indonesia, n.d.).

$INDSTR\_MIN_{it}$ = This is a dummy variable where mining firms are represented as 1, while the rest of the sectors are depicted as 0. The mining industry includes four subsectors: coal mining; crude petroleum and natural gas production; metal and mineral mining; and land or stone quarrying (IDX, 2018). This study predicts that mining firms will increase the cost of equity as mining projects encounter many uncertainties and hazards. The projects took plenty of time to be completed and to finally be profitable (Chinbat & Takakuwa, 2009; Liu et al., 2017; Saleh & Cummings, 2011). Furthermore, the stock prices of the mining industry faced a consecutive decline from 2011 to 2015. In particular, the mining sector suffered the highest decline of 41% in 2015, especially when compared with the Indonesian stock market, JKSE, whose stock prices declined just by 12% (Andirerei, 2019). Hence, investors tend to favour investing in other sectors as the mining sector contains high risks.

$INDSTR\_MISCE_{it}$ = This dummy variable depicts firms in the miscellaneous industry, which is further categorized into four subsectors: machinery and heavy equipment; automotive and components; textile and garment; footwear; cable; and electronics (IDX, 2018). It is projected that the INDSTR_MISCE will have a positive relationship with CoE. The stock prices of the miscellaneous industry declined by 19% in 2015, which is higher than the Indonesia Stock Market that declined by 12% (Andirerei, 2019). These risks are considered when investors decide to invest in this industry; thus, miscellaneous firms pay a higher cost of equity.

$INDSTR\_PROP_{it}$ = This variable represents firms in the property, real estate, and building construction industry (IDX, 2018). This variable is expected to increase the cost of equity. Although the property sector enjoyed a rapid growth from 2012 to 2014 which shows that it could be a good investment in the short-run, the growth finally slowed down in 2015 as a result of the new policies, such as an increase in the minimum down-payment requirement for purchasing property, the rise of interest rates, and postponed property projects (Indonesia Investments, 2018). Through this, investors could be uncertain about the future of the property, real estate, and building construction sector which increases the cost of equity.

$INDSTR\_TRADE_{it}$ = This sector is further divided into seven subsectors: wholesale; retail trade; restaurant, hotel and tourism; advertising, printing, and media; healthcare; computer and services; and investment company (IDX, 2018). This industry has been growing steadily since 2009 with the highest growth of 86%. Moreover, even though all industries declined in 2015, INDSTR_TRADE suffered the least with 3%, lower than the Indonesia Stock Market which declined by 12% (Andirerei, 2019). Like the consumer goods sector, the rise of buyers' purchasing power increases the demand for firms in the trade, service, and investment industry as well. Hence, this allows investors to perceive the INDSTR_TRADE to be a good investment with low risks, thus, reducing the cost of equity.

i = This indicates the 59 firms that will be analyzed in this research.

t =This represents theperiod of financial reporting which is from 2014 to 2017.

4. DATA ANALYSIS AND DISCUSSION

There is a total of 656 listed firms in IDX and only 579 firms are associated with XBRL reporting. However, the final selection of samples in this study is 59 listed firms. The author excluded firms that did not publicly report through the XBRL format from 2014 to 2017 as well as firms that did not have information available in all four years. To test the second hypothesis, this study applied a purposive sampling technique based on the firm size and the industry sector to be equal (Table 1). It is important to ensure that the sizes of the companies vary between large and small-sized firms to differentiate the effects of firm size on the cost of equity.

Moreover, the number of firms should be equally selected from eight industry sectors based on the availability of information.

The first analysis conducted was the descriptive statistics as presented in Table 2.

From the initial statistics tests on raw data, the author winsorized 2% of extreme values from CoE, LEVERAGE, RETVAR and 6% from MB Ratio. Winsorizing is more preferred than trimming the data because, in this case, the sample size is not large enough. After removing outliers, the authors have checked on the characteristics of the sample data through descriptive statistics. The mean, standard deviation, and median of the variables can be seen in Table 2. In conclusion, the sample data are moderately dispersed. In addition, the standard deviation of all variables is lower than the mean which means that the data are centrally distributed.

Since the formula considers the growth of earnings, it is a valuable indicator of the firm's future value. The growth is then divided by the market price which also helps to determine whether a stock price is overvalued or undervalued when compared with the earnings growth. A high cost of equity indicates that it is undervalued in comparison to the earnings growth and the other way around.

The result of the Pearson Correlation Coefficient shows that the first independent variable, XBRL ENV has a negative relationship with CoE. The inverse relationship implies that the adoption of XBRL increases the cost of equity. This finding contradicts the first hypothesis of this paper and will be explained together with the result from the OLS test.

Table 2
Descriptive Statistics for Non-nominal Variables

	Mean	Std Dev	Median	Min	Max
CoE	0.19	0.15	0.15	0.00	0.62
SIZE	29.56	1.55	29.29	25.82	33.32
LEV	0.43	0.20	0.44	0.04	1.00
RETVAR	0.31	0.26	0.26	0	1.05
MB RATIO	2.56	2.23	1.73	0.30	8.79

Source: Data Processing

Table 3
Pearson Correlation Coefficient

	CoE	XBRLENV	SIZE	LEV	RETVAR	MB RATIO
CoE	1					
XBRLENV	-0.109	1				
SIZE	-0.132	0.056	1			
LEV	0.117	-0.032	0.026	1		
RETVAR	0.022	0.07	-0.001	0.095	1	
MB RATIO	-0.189*	-0.057	-0.169*	0.12	-0.148*	1
INDSTR_AGR	0.069	0	0.059	-0.041	0.061	-0.032
INDSTR_BASIC	0.084	0	0.008	-0.038	0.129*	0.009
INDSTR_CONS	-0.181*	0	-0.058	0.027	-0.154*	0.295*
INDSTR_INFRA	-0.143*	0	0.204*	0.056	0.046	-0.078
INDSTR_MIN	0.107	0	0.134*	-0.133*	-0.098	-0.162*
INDSTR_MIS	0.078	0	-0.092	0.069	0.037	-0.04
INDSTR_PROPE	0.115	0	-0.092	-0.036	0.115	-0.112
INDSTR_TRADE	-0.073	0	-0.147*	0.076	-0.092	0.075

** Correlation is significant at the 0.05 level*

Source: Data Processing

Table 4
Pearson Correlation Coefficient

	IND_ AGR	IND_ BASIC	IND_ CONS	IND_ INFRA	IND_ MIN	IND_ MIS	IND_ PROPE	IND_ TRADE
CoE								
XBRLENV								
SIZE								
LEV								
RETVAR								
MB RATIO								
INDSTR_AGR	1							
INDSTR_BASIC	-0.113	1						
INDSTR_CONS	-0.143	-0.143*	1					
INDSTR_INFRA	-0.133*	-0.133*	-0.168*	1				
INDSTR_MIN	-0.123	-0.123	-0.156*	-0.145*	1			
INDSTR_MIS	-0.113	-0.113	-0.143*	-0.133*	-0.123	1		
INDSTR_PROPE	-0.123	-0.123	-0.156*	-0.145*	-0.135*	-0.123	1	
INDSTR_TRADE	-0.152*	-0.152*	-0.192*	-0.179*	-0.166*	-0.152*	-0.166*	1

** Correlation is significant at the 0.05 level (2-tailed)*
Source: Data Processing

Additionally, this study used the multiple regression analysis to run the data. This section will discuss the results obtained from performing the Variance Inflation Factor (VIF) of variables, adjusted R^2 of the model, f-stats, t-stats, and the p-value to test the significance. The alpha value used in this study is 0.1 as it is acceptable in the social science research area. The Variance Inflation Factor (VIF) is used to measure the correlation between the predictors in the model. It helps to detect collinearity problems that would affect the regression results. Table 5, shows that the VIF of the independent variables in this study does not show collinearity problems.

The hypothesis of this study states that the adoption of XBRL reporting increases the cost of equity. To test this hypothesis, the variable XBRL ENV was used to represent the post dummy variable. Based on Table 4.3, it suggests that after the adoption of XBRL, the cost of equity is reduced.

This finding contradicts the first hypothesis of this paper and prior study (Liu et al., 2014) which stated that XBRL adoption increases cost of equity of the early adopters. This can be explained with the facts that benefits of adopting XBRL allows firms to minimize human errors, improve the overall reporting quality for investors to make decisions, and reduce the information-processing costs that they need to determine firm value. These factors enhance the transparency of information, thus, reducing the cost of equity. The result of the study also reflects on the contingency theory which postulates the benefits of an innovation and technology differ from one institution, environment, as well as one country to another (J. Lee & Miller, 1996; Souitaris, 1999; Szász et al., 2020), with the contradicting result that is shown in Indonesia.

Another possible explanation for this is the influence of financial reporting transparency. Since the financial crisis in 1997 and 2008, Indonesia has realized the importance of transparency. In 2014, OJK issued a new guideline that highlights the improvement of transparency in financial information as well as the enhancement of shareholders' protection (OJK, 2014). It helps to reduce the risk that investors must take regarding the lack of transparent disclosures; thus, the cost of equity is reduced. Moreover, transparent information will help to reduce information-processing costs for investors. It was discussed previously that high reporting quality will affect the costs that investors undertake to evaluate a firm's value. Therefore, based on the transaction cost theory, this will reduce firms' cost of equity. As the guidelines were released in 2014 and this research was conducted from 2014 to 2017, the improvement in transparency might explain

why the correlation between CoE and XBRL ENV is weak (S. Chen et al., 2015; Coombes & Watson, 2000; Doidge et al., 2007). In addition, since the IFRS convergence in Indonesia was completed in 2012, it may influence the relationship between cost of equity and XBRL adoption (Suyatmini & FN, 2014). A past study found that IFRS convergence reduces the cost of equity significantly (M. Chen et al., 2017). It is stated that IFRS improves the overall reporting quality, specifically, the value relevance of earnings. This leads to a further reduction in the information-processing cost (E. Lee et al., 2013). However, the coefficient is weak since Indonesia is in the early adoption period which might also be prone to errors.

The result of the control variable of SIZE shows that it is statistically significant in influencing the dependent variable, CoE. It shows that smaller firms are riskier investments than larger firms; thus, the cost of equity is higher.This is in accordance with prior studies (Embong et al., 2012; Mendeloff et al., 2006).The other control variables can also be explained as follows. Accordingly, a firm that has more debts than assets will lead to an increase in the cost of equity. This finding is in accordance withother studies (Aharon & Yagil, 2019; Dhaliwal et al., 2006; O. Z. Li et al., 2012; S. Li, 2010). The significant result can be explained by the risk that a firm with high leverage might not be able to repay its debts. The RETVAR result implies that the return vari-ability is less influential when deciding the investment risks than other variables in the model. This finding is in accordance with prior research (Liu et al., 2014). Thampanya et al. (2020)stated that it is normal for stocks in the Indonesia Stock Market to be volatile as Indonesian investors rely more on behavioural factors rather than fundamental factors when referring to the firm value. The literature further explains that behav-ioural factors are influenced by emotions while the fundamental factors include firm analysis, such as the return variability (Thampanya et al., 2020).

The MB Ratio is statistically significant towards the cost of equity. The result is consistent with a prior study (Liu et al., 2014). A possible explanation is that, according to Arffa (2001), low market-to-book ratios could mean that the firm is in a financial distress and may go bankrupt; thus, it contains a risky investment and a higher cost of equity.

It is not specified that a low MB Ratio directly means that the stock is undervalued. The MB Ratio provides information on the value of stocks only when it is compared with the return on equity (ROE). This metric includes the firm's profitability; thus, a firm that has a low MB Ratio with a high ROE signifies that it has undervalued stocks.

Table 5
Multiple Regression Analysis

	Coefficient	t-stats	p-value	VIF
Constant	0.601	3.275	0.001*	
XBRL_ENV	-0.029	-1.637	0.096*	1.012
SIZE	-0.016	-2.585	0.010*	1.131
LEV	0.133	2.897	0.004*	1.064
RETVAR	-0.031	-0.850	0.396	1.109
MB Ratio	-0.012	-2.840	0.005*	1.193
INDSTR_AGR	0.087	2.343	0.020*	1.591
INDSTR_BASIC	0.094	2.540	0.012*	1.594
INDSTR_INFRA	0.003	0.072	0.942	1.797
INDSTR_MIN	0.097	2.677	0.008*	1.748
INDSTR_MIS	0.070	1.888	0.060*	1.590
INDSTR_PROPE	0.087	2.401	0.017*	1.731
INDSTR_TRADE	0.018	0.556	0.579	1.815
Adjusted R^2	12.50%			
F-statistics	3.804			
Sig.	0.000			

*Dependent Variable = CoE * Significance at p <0.1*

Source: Data Processing

The rest of the variables are dummy variables for each of the industry sectors selected for the sample. The regression model only shows seven industry variables, although there are a total of eight industry variables. This scenario is known as the dummy variable trap where the industry variables are highly correlated; thus, one variable can be predicted from the others (Vadakkanmarveettil, J., 2014). Hence, to avoid the dummy variable trap, it is important to remove one variable (n-1) from the categorical value (n). Moreover Vadakkanmarveettil (2014), stated that the removed variable has an insignificant relation with the dependent variable. Hence, INDSTR_CONS is removed since it is insignificant in affecting CoE. This means that investors of the consumer goods industry emphasize more on other significant factors in the model, such as XBRL adoption, firms' sizes, leverage, and market-to-book ratio, instead of minding the risks that this industry bears. The summary of the findings related to the industries and the explanations are discussed in Table 6.

Table 6
Summary of the Industry Variable Impacts on the Cost of Equity

Variables	Hypothesis	Findings	Discussion
INDSTR_AGRI/ Agriculture Industry	Significant and positive relationship	Significant and positive relationship	The industry is naturally risky with inconsistent quantity and quality of commodities produced (United States Department of Agriculture, 2020)
INDSTR_BASIC/ Basic Industry & Chemicals	Significant and positive relationship	Significant and positive relationship	The decline in INDSTR_PROP cause INDSTR_BASIC to decline as well (Fachrudin, n.d.; Tempo.co, 2015)
INDSTR_CONS/ Consumer Goods Industry	Significant and negative relationship	Insignificant relationship	Investors of this industry emphasize more on other significant variables
INDSTR_INFRA/ Infrastructure, Transport, & Utilities Industry	Significant and positive relationship	Insignificant relationship	Investors of this industry emphasize more on other significant variables
INDSTR_MIN/ Mining Industry	Significant and positive relationship	Significant and positive relationship	Mining projects are naturally risky and the stock prices frequently decline (Badri et al., 2012; Chinbat & Takakuwa, 2009; Saleh & Cummings, 2011; Luo & Liu, 2010)
INDSTR_MISCE/ Miscellaneous Industry	Significant and positive relationship	Significant and positive relationship	Demand declined since imported materials became more popular (Sari & Fachrudin, n.d.)
INDSTR_PROP/ Property, Real Estate, & Building Construction Industry	Significant and positive relationship	Significant and positive relationship	New policies cause industry growth to slow down (Indonesia Investments, 2015)
INDSTR_TRADE/ Trade, Service, & Investment Industry	Significant and positive relationship	Insignificant relationship	Investors of this industry emphasize more on other significant variables

Source: Data Processing

5. CONCLUSION, IMPLICATION, SUGGESTION AND LIMITATION

The different formats of financial reporting have caused users to encounter common problems which may have a critical impact on the reporting quality. XBRL was designed to solve these by becoming the universal format of financial reporting.

Until now, adopters and regulators are still exploring further about the extensive benefits of using the XBRL format, such as the impact on the cost of equity. This study contributes to the research topic which has an unclear conclusion on the relationship between XBRL and the cost of equity. In contradicting the first hypothesis which expected XBRL to increase the cost of equity, this paper concludes that during the early adoption period, XBRL reduces the cost of equity, although not substantially.

The study also reflects on the contingency theory which postulates the benefits of an innovation and technology which is differs from one institution, environment, as well as one country to another (J. Lee & Miller, 1996; Souitaris, 1999; Szász et al., 2020), with the contradicting result of XBRL towards COE that is shown in Indonesia. The finding of this research also contradicts past literature (Liu et al., 2014) which motivates this research. This is because XBRL technology improves the transparency and reliability of the financial information for users to make decisions through three main factors. First, the computer-readable program of XBRL minimizes human errors during the preparation of financial reports. Second, XBRL improves the financial reporting quality of: (1) relevance through the search-facilitating technology; (2) understandability by providing definitions of accounting concepts and automatically computing basic calculations; (3) and comparability through the single universally-accepted format (Birt et al., 2017). Third, as the information contains lower errors and higher reporting quality, the information-processing costs that investors need to determine firm value are reduced as well (Blankespoor, 2012; Hodge et al., 2004; Yoon et al., 2011). For instance, it includes the search costs to obtain relevant information, the costs for inexperienced users to learn accounting terms, and the costs to compare between different reports. Hence, these factors lead to lower risks that investors undertake which reduces the cost of equity as well. This study further found that the effect of XBRL adoption to the cost of equity is still weak as Indonesia was in the early adoption period where the technology was prone to errors.

Furthermore, this study revealed that small-sized firms are more likely to increase the investment risks which leads to a higher cost of equity. This is consistent with the second hypothesis of the study which explains that large-sized firms are more transparent and have better management (S. Chen et al., 2015; Hao et al., 2014). Second, the results show that high-leveraged firms experience a higher cost of equity as investors are concerned about the risks that they may not be able to pay their debts with their assets (Aharon & Yagil, 2019). Third, the return variability of the stock does not affect the cost of equity since Indonesian investors are more likely to decide risks based on behavioural factors instead of fundamental factors (Thampanya et al., 2020). This study also found that a low market-to-book ratio significantly increases the cost of equity (Liu et al., 2014). This can be explained as the low MB ratio implies that the firm is in financial instability (Arffa, 2001), which increases the risks that investors undertake, thus, increasing the cost of equity. In addition, this research also discussed five industries that are significantly related to the cost of equity: firms in agriculture; basic industry and chemicals; mining; miscellaneous; and property, real estate, and building construction sectors, which are more likely to increase the cost of equity. While the other three sectors have an insignificant relationship to the cost of equity: consumer goods; infrastructure, transportation, and utilities; and trade, service, and investment industries.

The findings of this research provide valuable information to the benefitted parties of this study, such as for standard setters. Even though past studies found that early adopters of the XBRL format experienced higher risks and cost of equity during the initial period, the Indonesian government and regulators can be assured. The regulators can use this study as a guideline that the other factors discussed above, such as good CG practices and IFRS convergence, help to ease the impact of XBRL adoption on cost of equity during the early period.

For investors and potential investors, they can obtain valuable information from the findings of this research, such as the negligible relationship between return variability and the cost of equity. As previously discussed, the weak relationship is explained as large-sized

firms have a higher return variability than small-sized firms. Nevertheless, this paper discovered that large-sized firms have lower risks than small-sized firms. Hence, instead of considering the return variability, investors are suggested to look at other information, such as the size, leverage, market-to-book ratio, and industry sector of the company. These predictors will provide better insights as to whether the stock is a good or bad investment.

For companies and other countries, companies can use this research to identify the predictors that have a significant effect on the cost of equity. They are able to pay a lower cost of equity by improving the reporting quality and reducing the information-processing costs. It is recommended for non-listed firms to adopt XBRL as well for the extensive benefits it offers.

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