The Impact of Disclosure Quality on Firm Performance: Empirical Evidence from Indonesia*

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Abstract

This study aims to examine whether an increased disclosure has a positive impact on firm performance and whether the opposite impact of increased disclosure on firm performance can occur in certain conditions – high proprietary information and competition. The sample for this study consists of Indonesian firms listed on the Indonesia Stock Exchange (IDX). The data were selected based on purposive sampling and panel data spanned eleven years (2006–2016). A panel GLS regression using moderated regression analysis (MRA) was adopted. The results of this study reveal that an increased disclosure has a positive effect on firm performance, but an increased disclosure has a negative impact on firm performance when proprietary information is high, and *vice versa*. Also, if the disclosure is increased, the negative impact of proprietary information on firm performance will get exacerbated in conditions where the competition level is high. The findings of this study suggest that, **s**ince the positive effect of continuously-increased disclosure on firm performance leads to the reversal (negative) impact when certain conditions occur (high proprietary information and competition), the level of disclosure quality is most likely to tap an 'optimal' point. In this regard, however, a broader investigation of all firms across countries still needs to be conducted.

Keywords: Optimal Disclosure, Increased Disclosure, Competition Level, Proprietary Information, Firm Performance

JEL Classification Code: G1, G2, G3, M4

1. Introduction

This research is directed at developing an optimal disclosure quality of firms listed in the Indonesia Stock Exchange (IDX) by examining the impact of trade-offs between increased and decreased financial disclosure on the firm performance when facing various proprietary information in the context of different industrial competition. With the dynamics of the competition level and the complexity of the industrial structure, disclosure policy must get attention because if the wrong disclosure policy will go into effect on the performance of the firms. Not all information must be disclosed to the public because, if all information is disclosed, it can have an impact on a competitive disadvantage since some information turns out to be proprietary-oriented, or known as proprietary information. It is information that should not be known to the public, such as details of financial data, laboratory test results that are not ready to be published, formulas and methods in the production process, new product plans, business and marketing plans, contracts, and trade secrets or other company secrets. Thus, if this information is provided to outside parties, it is expected that a future decline in cash flow will occur because it will result in a competitive disadvantage (see further in The United States Code, 1996, *inter alia*, in Section 1838, paragraph 3).

Beginning from a seminal study of accounting numbers by Ball and Brown (1968), decision usefulness issues were then addressed by many accounting scholars, such as Beaver (1968), Ou and Penman (1989), and Kothari (2001). Since then, some criticism appears to question the

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decision usefulness of accounting information, estimated to give only a 20% contribution in accounting for stock prices. Since the criticism, the issue of disclosure studies has evolved recently. The current issue of disclosure studies has been no longer related to increased disclosure but has led to a trade-off between increased and decreased disclosure. This means that an increased disclosure that is carried out continuously will result in a negative effect because it provides proprietary information. Besides, given this issue, the disclosure setting is not only focused on one disclosing firm, but also on interactive ways among the disclosing firms so that the positive and negative effects of the disclosure can be more comprehensively apprehended (Wagenhofer, 1990, 2000; Verrecchia, 1983; Gigler, 1994; Kirschenheiter, 1997; Newman & Sansing, 1993; Skinner, 1994; Pae, 2002; Dye, 1985; Dye & Sridhar, 1995; Scott, 2006; Christensen & Feltham, 2000; Evans III & Sridhar, 2002; Qiu et al., 2016; Rezaee & Tuo, 2017).

The previous literature on disclosure in general (Botosan, 1997; Sengupta, 1998; Leuz & Verrecchia, 2000; Baimukhamedova et al., 2017) focuses more on the impact of increased disclosure on reduced information asymmetry and cost of capital (bid-ask spreads, volume, and volatility). Other studies further address such resemblant issues as a correlation between the increased disclosure and the capital-market growth (Choi, 1974); impact of a regulatory disclosure on the cost of capital (Dhaliwal, 1979); a relationship between disclosure index and cost of capital (COC) (Botosan, 1997); a relationship between liquidity and timeliness, disclosure level (Frost & Botosan, 1997); impact of a rating disclosure on bid-ask spreads and COC (Sengupta, 1998); impact of disclosure ratings on several variables, e.g., the bid-ask spread (Healy et al., 1999); impact of an international reporting regime on bid-ask spreads, increased trade volume, reduced price volatility (Leuz & Verrecchia, 2000); impact of public disclosure of information on the cost of capital (Diamond & Verrecchia, 1991); and impact of disclosure on firm performance (Charumathi & Ramesh, 2020; Elfeky, 2017; Liu et al., 2014; Sharif & Lai, 2015; Tabash, 2019)

However, some other literature (Verrecchia, 1983; Evans III & Sridhar, 2002) contend that there is a trade-off between capital markets and product markets relating to disclosure: increased disclosure will result in increased proprietary costs, and, in turn, reduce the cost of capital; reduced disclosure will result in reduced proprietary costs, and, in turn, it increases the cost of capital (see Dutta & Nezlobin, 2016; Chen et al., 2018; Neifar & Jarboui, 2018; Dye & Hughes, 2018; Fatemi et al., 2018; Glaeser, 2018; Moses et al., 2018; Aobdia & Cheng, 2018; Callen et al., 2020). Also, the negative impact of increased disclosure on proprietary information will be more apparent when the competition is high (Ali et al., 2014; Huang et al., 2017; Orhun, 2019; Li et al., 2018).

Given the above description, to the best of my knowledge, previous studies generally shed more light on theoretical reviews (e.g., Verrecchia, 1983; Evans III & Sridhar, 2002) and the monotonic impact of increased disclosure level on many benefits (cost of capital, liquidity, risk, and many other measures of economic consequences) (Botosan, 1997; Frost & Botosan, 1997; Sengupta, 1998; Leuz & Verrecchia, 2000; Baimukhamedova et al., 2017). They also were conducted in fragmented tests (e.g., Glaeser, 2018; Ali et al., 2014; Huang et al., 2017; Orhun, 2019; Li et al., 2018). Besides, they provide inconsistent findings (Lang & Sul, 2014). As such, this study is differently directed at examining this issue in a more comprehensive context. This study is not only empirically aimed at examining whether increased disclosure has a positive impact on a firm's performance but also at testing whether the reversal (negative) impact of increased disclosure on a firm's performance at the high level of proprietary information exists, and, even further, whether the negative impact of increased disclosure on a firm's performance will be stronger on conditions when proprietary information is high, followed by the high level of competition.

These findings are expected to contribute the following ways. First, the results of this research, especially the models of disclosure test, are very useful especially for making investment and corporate managerial decisions (decision usefulness concept) of firms. If the research findings prove to be significant, the quality of disclosure can be predicted using this model. The quality of financial-statement information is not only determined by the extent of its quality (relevance and reliability) of financial statements, but must also consider its competitive-disadvantage effect for the firm of interest. Second, the synergistic combination of industrial structure concepts, industrial environment, and disclosure theories (Botosan, 1997; Botosan & Plumlee, 2002, 2005; Dhaliwal et al., 1979; Easley & O'hara, 2004, etc.) will be confirmed. The empirical evidence that increased disclosure does not always have a positive impact on a company's performance is also expected to contribute to confirming these theories towards an optimal disclosure policy, which will not harm themselves (the firm) and also do not jeopardize investors. Third, the trade-offs across disclosure models are intended to further improve the quality of the information in linking the value relevance of accounting fundamentals to stock values so that the increased relevance of information that aggregates a firm's disclosure trade-offs, all of which have never been previously investigated, should be empirically verified. This, then, can be used as a reference in business decision-making processes, investment decisions, risk management, and other managerial decisions.

The remainder of this paper is organized as follows: Section 2 reviews literature and hypothesis development; Section 3 outlines research methods. The results and discussion are provided in Section 4, while the conclusions and implications are stated in Section 5.

2. Literature Review and Hypothesis Development

Previous studies that explore whether the extent of the disclosure will provide benefits or usefulness (economic consequences) were documented by Copeland and Fredericks (1968) and Singhvi (1968). The studies that link disclosure levels of financial report to economic consequences (e.g., cost of capital, liquidity, risk, etc.) is then followed by many researchers, e.g., regarding the relationship between the increased disclosure and the capital markets growth (Choi, 1974), the impact of regulatory disclosure on the firm's cost of capital Dhaliwal (1979), between disclosure and cost of capital (COC) or liquidity (Diamond & Verrecchia, 1991; Botosan, 1997; Leuz & Verrecchia, 2000; Lang et al., 2012; Baimukhamedova et al., 2017), between liquidity and timely disclosure (Frost & Botosan, 1997), the impact of higher average disclosure rating on lower bid-ask spreads and COC (Sengupta, 1998), a relationship between increased-disclosure rating and several variables, including the bid-ask spread (Healy et al., 1999).

Meanwhile, in Indonesia, the studies that discuss disclosure have evolved since Baridwan et al. (2001), i.e., *inter alia*, the relationship of the index and corporate governance structure to disclosure quality (Khomsiah, 2005; Khanifah et al., 2020), the relationship between corporate governance and family firms with voluntary disclosure (Achmad, 2007), corporate social disclosure (Gunawan, 2007), the effect of company characteristics on CSR disclosure (Fauziyah & Siswantoro, 2016).

Lang et al. (2012) further positively found an empirical relationship between disclosure and liquidity. They use a mediating analysis to illustrate that liquidity is an important mechanism by which disclosure can increase a firm's value (Tobin's Q) (see also Charumathi & Ramesh, 2020) and also reduce the cost of capital. Other researchers, such as Elfeky (2017), Liu et al. (2014), and Sharif and Lai (2015), Tabash (2019), further, suggest that the extent of the disclosure are positively correlated with firm performance. Referring to these previous studies, Hypothesis 1 can be stated as follows:

H1: The higher the level of disclosure (both the level of relevance and reliability) is, the higher a firm's performance will be; and conversely, the lower the level of disclosure (both the level of relevance and reliability) is, the lower a firm's performance will be.

Given the development of the latest disclosure issues, disclosure has now led to a trade-off between increased and decreased disclosure and how it impacts performance. Verrecchia (1983) and Evans III and Sridhar (2002) show that there is a trade-off between capital market and product market which is related to disclosure: increased disclosure will result in increased proprietary costs, and in turn, reduce the cost of capital; reduced disclosure will result in reduced proprietary costs; and in turn, it increases the cost of capital. Gigler (1994), then, expands accounting research to question why firms do not voluntarily disclose all information they have (full disclosure). In contrast to previous studies showing that companies tend to hide private information to avoid proprietary costs, his study shows that the trade-off of their desire to report opportunistically to capital markets but pessimistically to competitors can make the firm's optimal disclosure credible (see also Kirschenheiter, 1997; Newman & Sansing, 1993; Skinner, 1994).

Specifically, Dye and Sridhar (1995) show that voluntary disclosure by some firms can provoke other firms to carry out related disclosure. Similar findings can also be found in other studies (Choi, 1974; Dhaliwal, 1979; Botosan, 1997; Frost & Botosan, 1997; Healy et al., 1999; Diamond & Verrecchia, 1991; Leuz & Verrecchia, 2000; Dutta & Nezlobin, 2016; Chen et al., 2018; Neifar & Jarboui, 2018; Dye & Hughes, 2018; Fatemi et al., 2018; Glaeser, 2018; Moses et al., 2018; Aobdia & Cheng, 2018; Callen et al., 2020). As such, much evidence concluding that increased disclosure positively affect firm performance as previously stated is conditional on the extent to which the proprietary information exists (see Figure 1); hence, that Hypothesis 2 is stated as follows:
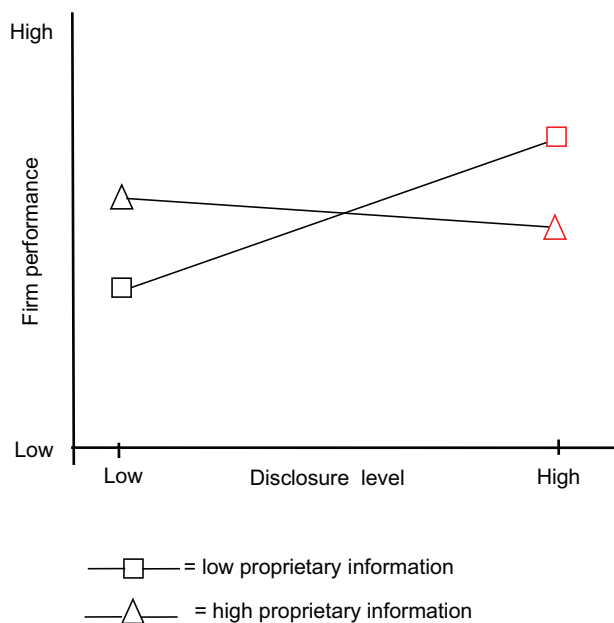
Figure 1: This Figure Illustrates the Extent to which the Effect of Disclosure Quality Level on Firm Performance Depends on the Proprietary Information Level. When Proprietary Information is High, Increased Disclosure will have a Negative Impact on a Firm's Performance; and *Vice Versa* when Proprietary Information is Low, Increased Disclosure will have a Positive Impact on a Firm's Performance (Hypothesis 2)

H2: On conditions in which proprietary information is high, the increased disclosure will have a negative impact on a firm's performance; and vice versa on conditions in which proprietary information is low, increased disclosure will have a positive impact on a firm's performance.

While the increased disclosure has a positive impact on performance (see Charumathi & Ramesh, 2020; Elfeky, 2017; Liu et al., 2014; Sharif & Lai, 2015; Tabash, 2019), and has a negative effect on asymmetric information (lower cost of capital), the disclosure, however, cannot be continuously extended due to its restriction of proprietary cost of information. Even though some findings regarding the relationship between optimal disclosure and proprietary information are considered complicated (see Leuz & Wysocki, 2016), their relationship is predicted to highly depend on the threat of existing competition. The existing evidence suggests that the negative correlation between the competition and disclosure level is more pronounced than otherwise (see also, *inter alia*, Verrecchia, 1990; Wagenhofer, 1990, 2000; Feltham et al., 1992; Ali et al., 2014; Huang et al., 2017; Orhun, 2019). Li et al. (2018), furthermore, reaffirm

that the stronger results regarding the negative relationship between proprietary information and disclosure level appear when the competition is increased than otherwise. Given the above explanation, the relationship between the level of disclosure that increases with the firm's performance and different levels of competition can be illustratively described in Figure 2. Referring to the above explanation, Hypothesis 3 is as follows:

H3: On conditions when the level of competition is more stringent, the negative impact of increased disclosure on a firm's performance is stronger than otherwise, i.e., when the level of competition is less stringent.

3. Research Method

3.1. Data and Samples

The sample of Indonesian firms for this study consists of all firms registered in the Indonesia Stock Exchange (IDX). The data were selected based on purposive sampling and panel data spanned eleven years (2006–2016) and
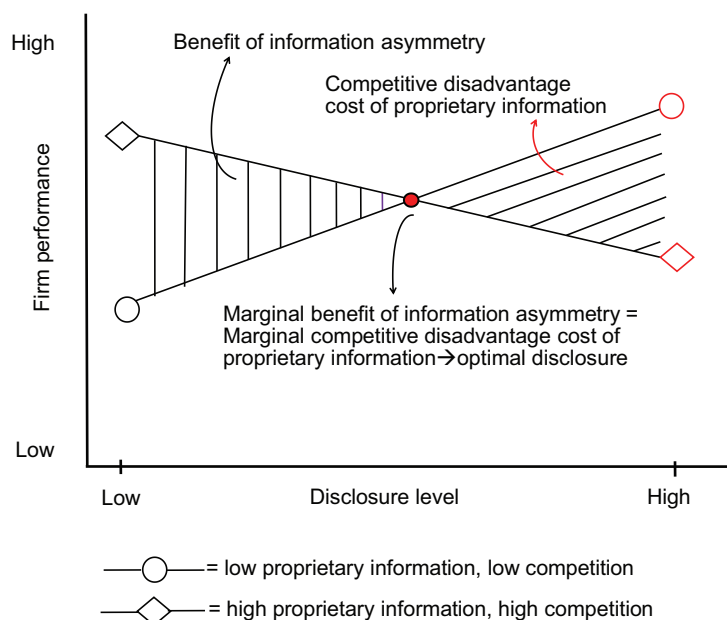
Figure 2: This Figure Illustrates the Extent to which the Effect of Disclosure Quality Level on Firm Performance Depends on the Proprietary Information Level, Accompanied by Competition Level (Hypothesis 3). On this Condition, it is Theoretically Conjectured that a Firm will Face a Trade-Off between Increasing Disclosure Level to get the Benefit of Information Asymmetry (Less Cost Of Capital) while Inducing Higher Cost of Proprietary Information (Competitive Disadvantage Cost) or Decreasing Disclosure Level to Earn Less Cost of Proprietary Information (Competitive Disadvantage Cost) while Boosting the Cost of Capital Due to Higher Information Asymmetry. This, in Turn, will Lead to an Equilibrium (Optimal) Point when the Marginal Benefit of Information Asymmetry is Equal to the Marginal Competitive Disadvantage Cost of Proprietary Information

averaged out as inputs to measure variables of interest in the observations of 2015 and 2016. Thus, the identified variables to be tested only involve two observations (years), i.e., 2015 and 2016. These two variables were previously measured using eleven years of financial data inputs, i.e., from 2006 to 2016. Overall, the criteria used in determining the sample are as follows: 1) data sample was taken from all firms that have annual financial information from 2006 through 2016; 2) the data sample is actively traded during the period of observations (2006–2016); 3) the data sample that consistently provides financial information and market data published every year from 2006 to 2016.

3.2. Testing Models

The following empirical models are used to test Hypothesis 1, Hypothesis 2, and Hypothesis 3 as follows:

$$PER_{i,t+1} = \alpha_0 + \alpha_1 \sum TDCL_{it} + \alpha_2 DIND_{it} + \alpha_3 DEIND_{it} + \alpha_4 LNSIZE_{it} + v_{it} \quad (1a, 1b, 1c)$$

$$PER_{i,t+1} = \alpha_0 + \alpha_1 \sum TDCL_{it} + \alpha_2 DINTA_{it} + \alpha_3 \sum DCL * DINTA_{it} + \alpha_4 DKOM_{it} + \alpha_5 DINTA_{it} + \alpha_6 DIND_{it} + \alpha_7 DEIND_{it} + \varepsilon_{it} \quad (2a, 2b, 2c)$$

$$PER_{i,t+1} = \alpha_0 + \alpha_1 \sum TDCL_{it} + \alpha_2 DINTA_{it} + \alpha_3 DKOM_{it} \alpha_4 \sum DCL * DINTA_{it} * DKOM_{it} + \alpha_5 DINTA_{it} + \alpha_6 DIND_{it} + \alpha_7 DEIND_{it} + \gamma_{it} \quad (3a, 3b, 3c)$$

where PER_{t+1} is firm performance measured by three proxies, i.e., 1) Price-to-book value ratio (PTB) which is measured by a ratio of price per share to book value per share in period $t + 1$, and 2) Return on assets (ROA) measured by profit divided by assets in period $t + 1$, 3) total financial performance (TFP), measured by an average combined metrics of PTB and ROA, i.e., scores of PTB plus ROA divided by two.

TDCL is a total disclosure level measured by a combination between VMH and CTA (the total scores of VMH and CTA divided by two). VMH is determined by referring to Kirschenheiter (1997) as also cited by Qizam (2011) and Qizam and Fong (2019). Kirschenheiter (1997) posits that asset value based on historical value is said to be more reliable than market value if the variance of the signaled value (market value) is higher than the variance of the value signaled by the accounting-based asset value (historical-book value). It means that financial disclosure quality (FDQ) is more apparent when VHM – that is measured by a ratio of the market-value variance divided by book value variance of firm i, period t – is higher than otherwise.

In terms of CTA (current assets divided by total assets), Scott (2006) also states that several components in the

financial statements have been measured using fair value either partially or completely, for example, trade payables, accounts receivable, leasing contracts (leasing), long-term debt, temporary investments (securities), inventory, ceiling test for capital assets, and some others. Of all the components mentioned above, the majority are current assets and current liabilities. As such, financial disclosure quality (FDQ) is also more pronounced (relevant) when a ratio of current assets divided by total assets (CTA) is higher than otherwise.

To determine the variables of financial disclosure quality (VMH and CTA), two years of observations (2015 and 2016) are addressed. Some relevant inputs of VMH need a long data series. VHM of firm i, period t was run over two years, VMH_{2015} and VMH_{2016}. The yearly VMH value of a company is measured by a ratio of the market value variance, divided by the book value variance for a company i in year t. Also, the calculation process is determined by the market value and book value series starting from 2006. For instance, the 2015 market value and 2015 book value variance are measured from 10 annual series of market values from 2006 to 2015; market value variance and book value variance for a company i in 2016 are determined from the next ten annual data series ranging from 2007–2016. Thus, it concludes that the overall financial data series required to measure financial disclosure quality levels related to VMH is a relatively long series of financial data from 2006–2016. Next, CTA, reflecting the level of disclosure quality related to relevance for a company i, period t was run for two observations, 2015 and 2016.

DKOM is a dummy value of the competition level (high *versus* low); initially measured by the value of the Herfindahl-Hirschman Index, namely:

$$HHI_{jt-1} = \sum_{i=1}^{Nj} S_{ijt-1}^2 \quad (4)$$

The level of competition is measured by HHI (Herfindahl-Hirschman Index), that is, the size of the competition defined as the sales-based Herfindahl-Hirschman Index (HHI). Lower HHI values indicate a high level of competitiveness; in the meantime, higher HHI values indicate a high level of concentration (this industry is less competitive). The HHI value is measured by the number of squares of the market-based market share; after that, it is distinguished between the above-average and below-average values with dummy value 1 = above average, and 0 = below average. S_{jit-1} shows the market-based market share of firm i in industry j in year t, and certain groups of firms were selected for each industry group; DIND = Industrial homogeneity effect with dummy variables (1 = homogeneous; 0 = heterogeneous); DEIND = The average effect of industrial profits with a dummy variable (1 = including the average high industry profit, and 0 = including the average low industrial profit); LNSIZE is

a variable to control for size effect measured by the natural logarithm of total assets, and v_{it}, ε_{it}, γ_{it} indicate error terms.

4. Results and Discussion

The descriptive statistics of the variables and the results and discussion of hypothesis testing are presented as follows:

4.1. Descriptive Statistics

Given the descriptive statistics (Table 1), it looks that the highest average points to VMH and the lowest falls in ROA. Meanwhile, the variability of VMH also looks to show the highest variance among the variables (its variance is 1102.035), and the variability of CTAI seems to be the lowest (its variance is 0.2067). Besides, all the VIF-values are lower than 10 (these results are not reported), suggesting that all the independent variables are free from the collinearity problem.

4.2. Testing Hypothesis 1

Testing hypothesis 1a is intended to prove that the higher the level of disclosure (both the level of relevance and reliability) is, the higher the firm's performance will be, with the following test results:

Given the results of testing Hypothesis 1 (see Table 2), it is shown that controlling for size (LNSIZE), industry homogeneity (DIND), and average-industry-profit effect (DEIND), a disclosure level positively affects firm performance proxied by three indicators, i.e., PTB, ROA, and TFP. All the coefficients on the relationship between the disclosure level, i.e., TDCL, and the three proxies of firm performance, i.e., PTB, ROA, and TFP denote their significance at a 0.01 level. Besides, the positive relationship between the disclosure level, i.e., TDCL and the three proxies of firm performance, i.e., PTB, ROA, and TFP also remains consistently significant, either before or after controlling for size (LNSIZE), industry homogeneity (DIND), and average-industry-profit effect (DEIND). This proves that Hypothesis 1 is empirically supported. All the control variables are also significant across all the proxies of firm performance (at a 0.01 level of significance). Given the above description, it can be concluded that the results of testing Hypothesis 1 (the higher the level of disclosure – both the level of relevance and reliability – is, the higher the firm performance will be) are empirically supported. All disclosure variables prove to have a positive effect on firm performance. As such, these results are convincingly consistent with Charumathi and Ramesh (2020), Elfeky (2017), Liu et al. (2014), Sharif and Lai (2015), and Tabash (2019).

4.3. Testing Hypothesis 2 and 3

Table 3 shows the results of testing Hypothesis 2 and Hypothesis 3. The results of testing Hypothesis 2 are depicted in Model 2a (TFP as the dependent variable), Model 2b (ROA as the dependent variable), and Model 2c (PTB as the dependent variable), controlling for competition level (DKOM), industry homogeneity (DIND), average-industry-profit, and size (LNSIZE) effect (DEIND). Table 3 shows that Hypothesis 2 is supported (*p*-value is lower than 0.01 at a 0.01 level of significance) when the firm's performance is proxied by total firm performance (TFP) using Model 2c and by PTB using Model 2a (the best model is indicated in Model 2c with adj-R^2 = 0.186, higher than adj-R^2 = 0.155 in Model 2a), while in Model 2b (ROA as the dependent

Table 1: Descriptive Statistics

Variables	Obs (N × T)	Mean	Median	Maximum	Minimum	Std. Dev.
TFP	444	61.929	0.551	3200.030	−4.919	343.101
PTB	444	123.637	1.070	6400.000	−1.830	686.220
ROA	444	0.220	0.021	46.482	−11.558	3.115
TDCL	444	67.575	2.268	8159.164	0.105	551.007
VMH	444	134.643	4.218	16317.880	0.002	1102.035
CTA	444	0.506	0.506	0.998	0.074	0.207
DINTA	444	0.423	0.000	1.000	0.000	0.495
DKOM	444	0.655	1.000	1.000	0.000	0.476
DIND	444	0.500	0.500	1.000	0.000	0.500
DEIND	444	0.446	0.000	1.000	0.000	0.498
LNSIZE	444	21.255	21.317	25.811	17.046	1.686
Obs.	222 × 2					

Table 2: Testing Hypothesis 1

Independent Variables	Signs	Model 1a	Model 1b	Model 1c	Model 1a	Model 1b	Model 1c
C	?	10.291***	0.119***	5.390***	−85.822***	1.372***	−39.90***
TDCL	+	0.008***	4.56E−05***	0.004***	0.006***	1.78E−05***	0.004***
DIND	?				10.848***	−0.153***	4.671***
DEIND	?				30.487***	0.131***	14.000***
LNSIZE	?				3.778***	−0.060***	1.777***
R^2		0.194	0.033	0.194	0.319	0.632	0.362
Adjusted R^2		0.193	0.031	0.192	0.313	0.628	0.356
F-statistic		106.75	15.349	106.161	51.464	188.661	62.356
Prob (F-stat.)		0.000	0.000	0.000	0.000	0.000	0.000

Note: Table 2 contains the results of testing Hypothesis 1 where the disclosure level is combining the level of relevance (VMH) and reliability (CTA) into total disclosure (TDCL) for all the models. Model 1a examines the disclosure effect on firm performance which is proxied by PTB; Model 1b tests the same case but firm performance is proxied by return on asset (ROA), and Model 1c examines the disclosure effect on firm performance proxied by Total Financial Performance (TFP) built from a combined metrics of PTB and ROA (TFP is measure from PTB plus ROA divided by two). *Significant at a 0.1 level; **significant at a 0.05 level; ***significant at a 0.01 level.
Source: These results are adapted from the outputs of Eviews.

Table 3: Testing Hypothesis 2 and 3

Independent Variables	Signs	Model 2a	Model 3a	Model 2b	Model 3b	Model 2c*	Model 3c**
C	?	−50.757***	−78.180***	0.765***	0.624***	−29.753***	−45.794***
TDCL	?	0.025***	0.009***	−6.91E−05***	4.50E−06	0.014***	0.005***
DKOM	?		10.495***		−0.104***		6.056***
DINTA	?	4.517***	6.046***	−0.043***	−0.039***	2.362***	3.307***
TDCL*DINTA	−	−0.018***		0.0001***		−0.011***	
TDCL*DINTA*DKOM	−		−0.004		7.02E−05		−0.004***
DKOM	?	7.719***		−0.119***		4.417***	
DIND	?	−3.303***	−3.799**	−0.066***	−0.056***	−2.263***	−2.625***
DEIND	?	8.659*	7.969	0.128***	0.117***	3.784	3.214
LNSIZE	?	2.439***	3.718***	−0.029***	−0.024***	1.449***	2.201***
R^2		0.168	0.273	0.539	0.284	0.199	0.312
Adjusted R^2		0.155	0.261	0.532	0.273	0.186	0.301
F-statistic		12.606	23.392	73.102	24.779	15.50	28.261
Prob. (F-statistic)		0.000	0.000	0.000	0.000	0.000	0.000

Note: Table 3 covers the results of testing the moderating effects of proprietary information (Hypothesis 2) and proprietary information conditioned with competition (Hypothesis 3) on the relationship between a financial disclosure level and firm performance using the three proxies of PTB (Model 2a and 3a), ROA (Model 2b and 3b), and TFP (Model 2c and 3c) (a combined metrics between PTB and ROA). *, **The best models to test Hypotheses 2 and 3 respectively. *Significant at a 0.1 level; **significant at a 0.05 level; ***significant at a 0.01 level.
Source: these results are adapted from the outputs of Eviews.

variable), the results do not follow the expectations of the hypothesis (H2) (indicated by a significant coefficient at a 0.01 level of significance, but in a positive sign).

Overall, these results (Table 3) of testing Hypothesis 2 suggest that the negative impact of increased financial disclosure on firm performance occurs on conditions when proprietary information of a firm is high, and *vice versa*, the positive impact of increased financial disclosure on firm performance occurs on conditions when proprietary information of a firm is low or zero. As a result, these results confirm the previous findings (e.g., *inter alia*, Leuz & Verrecchia, 2000; Dutta & Nezlobin, 2016; Chen et al., 2018; Neifar & Jarboui, 2018; Dye & Hughes, 2018; Fatemi et al., 2018; Glaeser, 2018; Moses et al., 2018; Aobdia & Cheng, 2018; Callen et al., 2020).

Henceforth, the results (Table 3) of testing Hypothesis 3 are portrayed in Model 3a (PTB as the dependent variable), Model 3b (ROA as the dependent variable), and Model 3c (TFP as the dependent variable), controlling for industry homogeneity (DIND), average-industry-profit, and size (LNSIZE) effect (DEIND). From these results in Table 3, Hypothesis 3 is also supported, indicated by the negative and significant moderating effect of DKOM combined with DINTA (p-value < 0.01 at a 0.01 level of significance with a coefficient = –0.004) on the relationship between financial disclosure and firm performance proxied by TFP (the best model in Model 3c), but not the case for firm performance proxied by PTB and ROA, being inconsistent with the hypothesis' prediction.

To conclude, although the two models (Model 3a and 3b) using firm performance proxied by PTB and ROA does not demonstrate their insignificant coefficients, the results of model 3c (the best model) using the composite proxy of TDCL from PTB and ROA conclusively support Hypothesis 3, suggesting that the negative impact of increased financial disclosure on firm performance on conditions when proprietary information of a firm is high will be exacerbated when an industry competition is high (indicated in Model 3c with adj-R^2 = 0.301, higher than adj-R^2 = 0.186 in Model 2c).

As such, these results also confirm the previous findings, suggesting that a continuously-increased disclosure will have a negative impact on a firm's performance because of a firm's proprietary information, thereby, in turn, leading to competitive disadvantage (see, *inter alia*, Wagenhofer, 1990, 2000; Verrecchia, 1983; Gigler, 1994; Kirschenheiter, 1997; Newman & Sansing, 1993; Skinner, 1994; Pae, 2002; Dye & Sridhar, 1995; Christensen & Feltham, 2000; Evans III & Sridhar, 2002; Qiu et al., 2016; Rezaee & Tuo, 2017) and inefficiency (see, *inter alia*, Fatemi et al., 2018; Glaeser, 2018; Moses et al., 2018; Aobdia & Cheng, 2018; Ali et al., 2014; Huang et al., 2017; Orhun, 2019; Li et al., 2018).

In the robustness test (Table 4), TDCL, then, was unraveled into their proxy components, i.e., CTA and VMH to see the relative importance of each proxy for the composite proxy of TDCL when the two proxies (CTA and VMH) are tested. The robustness-test results confirm that a financial disclosure quality proxied by CTA denotes its effect on firm performance (proxied by ROA as highlighted in Model 2b1 and 3b1) more consistently than when a financial disclosure quality proxied by VMH and firm performance (proxied by PTB as highlighted in Model 2a1 and 3a1). All the coefficients of interest are consistent with Hypotheses 2 and 3 at a 0.01 level of significance (their significant coefficients denote –0.181 and –0.190 in Model 2b1 and 3b1, respectively). These results also suggest that firm performance that reflects earnings (ROA) seems to be more pronounced than a firm's non-earning performance (PTB). Also, a financial disclosure quality that reflects relevance (CTA) is more paramount than when a financial disclosure quality reflects reliability (VMH).

5. Conclusion

Hypothesis 1 – the higher the level of disclosure (both the level of relevance and reliability) is, the higher the firm performance will be – is empirically supported (See, *inter alia*, Chen et al. 2018; Neifar & Jarboui, 2018; Dye & Hughes, 2018; Fatemi et al., 2018; Glaeser, 2018; Moses et al., 2018; Tabash, 2019; Charumathi & Ramesh, 2020). Besides, these results also support Hypotheses 2 and 3, confirming the previous findings that a continuously-increased disclosure will have a negative impact on firm performance when proprietary information exists (see, *inter alia*, Chen et al., 2018; Glaeser, 2018; Moses et al., 2018; Aobdia & Cheng, 2018; Callen et al., 2020). Also, the findings that the negative effect of the disclosure level on firm performance on conditions of the high proprietary cost of information will be stronger when the level of competition is high confirms the previous insights as stated by Ali et al. (2014), Huang et al. (2017), Orhun (2019), and also Li et al. (2018).

As such, these results also confirm the theory that the increased disclosure will have a positive impact on a firm's performance, being subject to certain conditions greatly influenced by the level of proprietary information and competition. Thus, optimal disclosure quality will be more likely to be achieved by considering between the decreased disclosure level to minimize competitive disadvantage driven by proprietary information cost and level of competition, and the increased disclosure level to get the benefits from the lower information asymmetry (less cost of capital). Since this research uses real settings in the capital market, the development of optimal disclosure cannot be tested by controlling the variables of interest fully, so that the optimal results of this research can be merely demonstrated intuitively through changing disclosure levels being subject to certain conditions of competition level and proprietary

Table 4: Results of Robustness Test

Dependent Variables		PTB	PTB	PTB	PTB	ROA	ROA	ROA	ROA
Independent Variables	Signs	Model 2a1	Model 3a1	Model 2a2	Model 3a2	Model 2b1	Model 3b1	Model 2b2	Model 3b2
C	?	–4.986	–213.898	–50.842***	–78.269***	–0.175	–0.125**	0.765***	0.624***
CTA	?	16.787***	63.246*			0.346***	0.700***		
VMH	?			0.013***	0.005***			–3.46E–05***	2.17E–06
DKOM	?		52.904***		10.504***		–0.075***		–0.039***
DINTA	?	8.376***	53.133***	4.514***	6.047***	0.075***	–0.035***	–0.043***	–0.104***
CTA*DINTA	–	–17.305***				–0.181***			
CTA*DINTA* DKOM	–		–124.9585				–0.190***		
VMH*DINTA	–			–0.009***				5.35E–05***	
VMH*DINTA* DKOM	–				0.0013				3.52E–05***
DKOM	?	0.952***		7.729***		–0.079***		–0.119***	
DIND	?	–14.756***	–122.435	–3.310***	1.609**	–0.028***	–0.113***	–0.066***	–0.056***
DEIND	?	4.437***	93.604*	8.643*	5.544	0.095***	0.119***	0.128***	0.117***
LNSIZE	?	0.579***	13.482	2.444***	0.364***	0.004	–0.0005	–0.029***	–0.024***
R^2		0.079	0.038	0.168	0.273	0.307	0.724	0.539	0.284
Adjusted R^2		0.065	0.023	0.155	0.261	0.296	0.719	0.532	0.273
F–statistic		5.379	2.503	12.622	23.371	27.634	163.43	73.085	24.77
Prob. (F–statistic)		0.000	0.0157	0.000	0.000	0.000	0.000	0.000	0.000

Note: Table 4 contains the results of robustness tests on testing Hypotheses 2 and 3 to investigate the disclosure effect by raveling the composite proxy of TDCL into two proxies, related to relevance (CTA) and reliability (VMH), on the relationship between the level of proprietary information and the firm performance proxied by PTB and ROA either when conditioned with or without the level of competition.
*significant at a 0.1 level; **significant at a 0.05 level; ***significant at a 0.01 level.
Source: these results are adapted from the outputs of Eviews.

information. Hence, the extent to which certain conditions are, and the degree to which the optimal level of disclosure should 'exactly' be for the firms cannot be empirically tested.

The results of robustness tests also imply that a firm's performance that is driven by earnings seems to be more apparently observed than by a firm's non-earnings. Also, a financial disclosure that gives more emphasis on relevance (CTA) is more pronounced than when a financial disclosure is focused on reliability (VMH). Despite the empirical support confirming the theory, this paper also still enjoys some limitations. From a variety of the disclosure proxies, inconsistent results exist on some proxies either related to a financial disclosure level or firm performance so that more proxies that are more relevant and valid need to be developed to a broader context, involving not only financial but also non-financial disclosures. Likewise, the firm's performance proxy can also be expanded by involving not only a short-term but also long-term performance that better reflects the value of the firm.

References

Achmad, T. (2007). Corporate governance of family firms and voluntary disclosure: The case of Indonesian manufacturing firms. *Unpublished Dissertation*. http://theses.library.uwa.edu. au/ adtWU2008.0042/ public/02whole.pdf

Ali, A., Klasa, S., & Yeung, E. (2014). Industry concentration and corporate disclosure policy. *Journal of Accounting and Economics*, *58*(2–3), 240–264. http://dx.doi.org/10.1016/j. jacceco.2014.08.004

Aobdia, D., & Cheng, L. (2018). Unionization, product market competition, and strategic disclosure. *Journal of Accounting and Economics*, *65*(2–3), 331–357. https://doi.org/10.1016/j.jacceco.2018.01.002

Baimukhamedova, A., Baimukhamedova, G., & Luchaninova, A. (2017). Financial Disclosure and the Cost of Equity Capital: The Empirical Test of the Largest Listed Companies of Kazakhstan, *Journal of Asian Finance, Economics and Business, 4*(3), 5–17. https://doi.org/10.13106/jafeb.2017.vol4.no3.5

Ball, R., & Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of Accounting Research*, *6*(2), 159–178. https://doi.org/DOI: 10.2307/2490232

Baridwan, Z., Machfoedz, M., & Tearney, M. G. (2001). *An Evaluation of Disclosure of Financial Information by Public Companies in Indonesia*. A research report by the SIAGA-PPA joint project, Faculty of Economics and Business, Universitas Gadjah Mada.

Beaver, W. H. (1968). The information content of annual earnings announcements. *Journal of Accounting Research*, *6*(Empirical Research in Accounting: Selected Studies), 67–92. https://doi.org/DOI: 10.2307/2490070

Botosan, C. A. (1997). Disclosure level and the cost of equity capital. *The Accounting Review*, *72*(3), 323–349. https://www.jstor.org/stable/248475

Botosan, C. A., & Plumlee, M. A. (2002). A re-examination of disclosure level and expected cost of equity capital. *Journal of Accounting Research*, *40*(1), 21–40. https://doi.org/10.1111/1475-679X.00037

Botosan, C. A., & Plumlee, M. A. (2005). Are information attributes are priced? *The Accounting Review*, *80*(1), 21–53. http://dx.doi.org/10.2139/ssrn.475222

Callen, J. L., Fang, X., & Zhang, W. (2020). Protection of proprietary information and financial reporting opacity: Evidence from a natural experiment. *Journal of Corporate Finance*, *64*(101641), 1–24. https://doi.org/10.1016/j.jcorpfin.2020.101641

Charumathi, B., & Ramesh, L. (2020). Impact of Voluntary Disclosure on Valuation of Firms: Evidence from Indian Companies. *Vision: The Journal of Business Perspective*, *24*(2), 194–203. https://doi.org/10.1177/0972262920914138

Chen, Y.-C., Hung, M., & Wang, Y. (2018). The effect of mandatory CSR disclosure on firm profitability and social externalities: Evidence from China. *Journal of Accounting and Economics*, *65*(1), 169–190. https://doi.org/10.1016/j.jacceco.2017.11.009

Choi, F. D. S. (1974). European disclosure: The competitive disclosure hypothesis. *Journal of International Business Studies*, *5*(2), 15–23. https://doi.org/10.1057/palgrave.jibs.8490706

Christensen, P. O., & Feltham, G. A. (2000). Market performance measures and disclosure of private management information in capital markets. *Review of Accounting Studies*, *5*(4), 301–329. https://doi.org/10.1023/A:1026545622749

Copeland, R. M., & Fredericks, W. (1968). Extent of disclosure. *Journal of Accounting Research*, *6*(1), 106–113. https://doi.org/DOI: 10.2307/2490127

Dhaliwal, D. S. (1979). Disclosure regulations and the cost of capital. *Southern Economic Journal*, *45*(3), 785–794. https://doi.org/DOI: 10.2307/1057477

Dhaliwal, D. S., Spicer, B. H., & Vickrey, D. (1979). The quality of disclosure and the cost of capital. *Journal of Business Finance and Accounting*, *6*(2), 245–266. https://doi.org/10.1111/j.1468-5957.1979.tb01089.x

Diamond, D. W., & Verrecchia, R. E. (1991). Disclosure, liquidity, and the cost of capital. *The Journal of Finance*, *46*(4), 1325–1359. https://doi.org/10.2307/2328861

Dutta, S., & Nezlobin. (2016). Dynamic effects of information disclosure on investment efficiency. *Journal of Accounting Research*, *55*(2), 329–369.

Dye, R. A. (1985). Disclosure of Nonproprietary Information. *Journal of Accounting Research*, *23*(1), 123–145. https://doi.org/10.2307/2490910

Dye, R. A., & Hughes, J. S. (2018). Equilibrium voluntary disclosures, asset pricing, and information transfers. *Journal of Accounting and Economics*, *66*(1), 1–24. https://doi.org/10.1016/j.jacceco.2017.11.003

Dye, R. A., & Sridhar, S. S. (1995). Industry-wide disclosure dynamics. *Journal of Accounting Research*, *33*(1), 157–174. https://doi.org/10.2307/2491297

Easley, D., & O'hara, M. (2004). Information and the cost of capital. *The Journal of Finance*, *59*(4), 1553–1583. https://doi.org/10.1111/j.1540-6261.2004.00672.x

Elfeky, M. I. (2017). The extent of voluntary disclosure and its determinants in emerging markets: Evidence from Egypt. *The Journal of Finance and Data Science*, *3*(1–4), 45–59. https://doi.org/10.1016/j.jfds.2017.09.005

Evans III, J. H., & Sridhar, S. S. (2002). Disclosure-disciplining mechanism, capital markets, product market and shareholder litigation. *The Accounting Review*, *77*(3), 595–626. https://www.jstor.org/stable/3068889

Fatemi, A., Glaum, M., & Kaiser, S. (2018). ESG performance and firm value: The moderating role of disclosure. *Global Finance Journal*, *33*(November), 45–64. https://doi.org/10.1016/j.gfj.2017.03.001

Fauziyah, Y., & Siswantoro, D. (2016). Analysis of ethical identity disclosure and Sharia banking's performance in Indonesia, *SNA XIX*, UNILA Lampung, Indonesia.

Feltham, G. A., Gigler, F. B., & Hughes, J. S. (1992). The effects of line-of-business reporting on competition in oligopoly settings. *Contemporary Accounting Research*, *9*(1), 1–23. https://doi.org/10.1111/j.1911-3846.1992.tb00865.x

Frost, C., & Botosan, C.A. (1997). Regulation, disclosure and market liquidity (an examination of foreign issuers in regulated versus less-regulated US equity markets). Retrieved February 17, 2021, from https://ssrn.com/abstract=10618

Gigler, F. (1994). Self-enforcing voluntary disclosures. *Journal of Accounting Research*, *32*(2), 224–240. https://doi.org/10.2307/2491283

Glaeser, S. (2018). The effects of proprietary information on corporate disclosure and transparency: Evidence from trade secrets. *Journal of Accounting and Economics*, *66*(1), 163–193. https://doi.org/10.1016/j.jacceco.2018.04.002

Gunawan, J. (2007). Corporate social disclosures by Indonesian Listed Companies: A pilot study. *Social Responsibility Journal*, *3*(3), 26–34. https://doi.org/10.1108/17471110710835554

Healy, P. M., Hutton, A. P., & Palepu, K. G. (1999). Stock performance and intermediation changes surrounding sustained increases in disclosure. *Contemporary Accounting Research*, *16*(3), 485–520. http://dx.doi.org/10.1111/j.1911-3846.1999.tb00592.x

Huang, Y., Jennings, R., & Yu, Y. (2017). Product market competition and managerial disclosure of earnings forecasts: Evidence from important tariff rate reductions. *The Accounting Review*, *92*(3), 185–207. https://doi.org/10.2308/accr-51558

Khanifah, K., Hardiningsih, P., Darmaryantiko, A., Iryantik, I., & Udin, U. (2020). The Effect of Corporate Governance Disclosure on Banking Performance: Empirical Evidence from Iran, Saudi Arabia and Malaysia, *Journal of Asian Finance, Economics and Business, 7*(3), 41–51. https://doi.org/10.13106/jafeb.2020.vol7.no3.41

Khomsiah (2005). Analysis of the relationship between the index and corporate governance structure on the disclosure quality. Unpublished PhD Dissertation, Gadjah Mada University.

Kirschenheiter, M. (1997). Information quality and correlated Signals. *Journal of Accounting Research*, *35*(1), 43–59. https://doi.org/10.2307/2491466

Kothari, S. P. (2001). Capital markets research in accounting. *Journal of Accounting and Economics*, *31*(1–3), 105–231. https://doi.org/10.1016/S0165-4101(01)00030-1

Lang, M. H., & Sul, E. (2014). Linking industry concentration to proprietary costs and disclosure: Challenges and opportunities. *Journal of Accounting and Economics*, *58*(2–3), 265–274. https://doi.org/10.1016/j.jacceco.2014.08.008

Lang, M., Lins, K. V., & Maffett, M. (2012). Transparency, liquidity, and valuation: International evidence on when transparency matters most. *Journal of Accounting Research*, *50*(3), 729–774. https://doi.org/10.1111/j.1475-679X.2012.00442.x

Leuz, C., & Verrecchia, R. E. (2000). The economic consequences of increased disclosure. *Journal of Accounting Research*, *38*(Supplement), 91–124. https://doi.org/10.2307/2672910

Leuz, C., & Wysocki, P. D. (2016). The economics of disclosure and financial reporting regulation: Evidence and suggestions for future research. *Journal of Accounting Research*, *54*(2), 525–622. https://doi.org/10.1111/1475-679X.12115

Li, Y., Lin, Y., & Zhang, L. (2018). Trade secrets law and corporate disclosure: Causal evidence on the proprietary cost hypothesis. *Journal of Accounting Research*, *56*(1), 265–308. https://doi.org/10.1111/1475-679X.12187

Liu, Y. C. A., Hsu, A. C., & Li, Y. Y. (2014). The Effect of Information Disclosure on Corporate Performance. *Information Technology Journal*, *13*(13), 2079–2092. https://doi.org/10.3923/itj.2014.2079.2092

Moses, O., Houqe, M. N., & Zijl, T. van. (2018). What is the Economic Value of the Extractive Industries Transparency Initiative (EITI) Information Disclosure? *Journal of Contemporary Accounting & Economics*, *14*(2), 216–233. https://doi.org/10.1016/j.jcae.2018.05.003

Neifar, S., & Jarboui, A. (2018). Corporate governance and operational risk voluntary disclosure: Evidence from Islamic banks. *Research in International Business and Finance*, *46*(December), 43–54. https://doi.org/10.1016/j.ribaf.2017.09.006

Newman, P., & Sansing, R. (1993). Disclosure policies with multiple users. *Journal of Accounting Research*, *31*(1), 92–112. https://doi.org/10.2307/2491043

Orhun, E. (2019). Voluntary disclosure and market competition: Theory and evidence from the U.S. services sector. *Research in International Business and Finance*, *47*(January), 354–370.

Ou, J. A., & Penman, S. H. (1989). Financial statement analysis and the prediction of stock returns. *Journal of Accounting and Economics*, *11*(4), 295–329. https://doi.org/10.1016/0165-4101(89)90017-7

Pae, S. (2002). Optimal disclosure policy in oligopoly markets. *Journal of Accounting Research*, *40*(3), 901–932. https://doi.org/10.1111/1475-679X.00076

Qiu, Y., Shaukat, A., & Tharyan, R. (2016). Environmental and social disclosures: Link with corporate financial performance. *The British Accounting Review*, *48*(1), 102–116. https://doi.org/10.1016/j.bar.2014.10.007

Qizam, I. (2011). The economic value of financial statement information risk and the risk relevance of fundamentals. Unpublished PhD Dissertation. Universitas Gadjah Mada.

Qizam, I., & Fong, M. (2019). Developing financial disclosure quality in sukuk and bond market: Evidence from Indonesia, Malaysia, and Australia. *Borsa Istanbul Review*, *19*(3), 228–248. https://doi.org/10.1016/j.bir.2019.05.002

Rezaee, Z., & Tuo, L. (2017). Voluntary disclosure of non-financial information and its association with sustainability performance. *Advances in Accounting*, *39*(December), 47–59. https://doi.org/10.1016/j.adiac.2017.08.001

Scott, W. R. (2006). *Financial Accounting Theory* (4th Ed.). Upper Saddle River, NJ: Prentice Hall.

Sengupta, P. (1998). Corporate disclosure quality and the cost of debt. *The Accounting Review*, *73*(4), 459–474. https://www.jstor.org/stable/248186

Sharif, S. P., & Lai, M. M. (2015). The effects of corporate disclosure practices on firm performance, risk and dividend policy. *International Journal of Disclosure and Governance*, *12*(4), 1–16. https://doi.org/10.1057/jdg.2015.2

Singhvi, S. S. (1968). Corporate disclosure through annual reports in the USA dan India. *Journal of Finance*, *23*(3), 551–552. http://hdl.handle.net/10.1111/j.1540-6261.1968.tb00838.x

Skinner, D. J. (1994). Why firms voluntarily disclose bad news. *Journal of Accounting Research*, *32*(1), 38–60. https://doi.org/10.2307/2491386

Tabash, M. I. (2019). An Empirical Investigation on the Relation between Disclosure and Financial Performance of Islamic Banks in the United Arab Emirates, *Journal of Asian Finance, Economics and Business, 6*(4), 27–35. https://doi.org/10.13106/jafeb.2019.vol6.no4.27

The United States Code. (1996). *Economic Espionage Act of 1996* (Title 18, Section 1838, paragraph 3). http://www.tscm.com/USC18_90.html

Verrecchia, R. E. (1983). Discretionary disclosure. *Journal of Accounting and Economics*, *5*(December), 179–194. https://doi.org/10.1016/0165-4101(83)90011-3

Verrecchia, R. E. (1990). Information Quality and Discretionary Disclosure. *Journal of Accounting and Economics*, *12*(4), 365–380. https://doi.org/10.1016/0165-4101(90)90021-U

Wagenhofer, A. (1990). Voluntary disclosure with a strategic opponent. *Journal of Accounting and Economics*, *12*(4), 341–363. https://doi.org/10.1016/0165-4101(90)90020-5

Wagenhofer, A. (2000). Disclosure of proprietary information in the course of an acquisition. *Accounting and Business Research*, *31*(1), 57–69. https://doi.org/10.1080/00014788.2000.9729598