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Managers' Motives behind the Quality of Segment Disclosure

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ABSTRACT

This research underlines two perspectives to scrutinize the managers' motives on the quality of segment disclosure. From the agency perspective, this research aims to find the effect of cost made by managers as the part of agency motive in disclosing information related to the business segment, while from the signaling perspective, this research also seeks to find the effect of business diversification as a signal to determine the disclosure quality of the segment. The sample included public firms listed in Indonesia. The nexus between variables was analyzed using fixed effect model with generalized least squares including cross-section weights and checked using robustness tests. The findings of this research disclose that the effect of cost made by managers is positive on the level of segment disclosure quality. They indicate that managers use the agency motive to improve the quality of the disclosure. The costs made by them through the transfer of funds across segments intend to manage the inefficient segment performances. This research also discloses that managers use business diversification as a signaling motive to spur the quality. In addition, the interplay function between quantity and quality is found. It means that the improved quality of segment disclosure reflects a larger quantity.

Keywords: Agency, Segment disclosure, Signal, Quality, Quantity.

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دوافع المدير وراء جودة الإفصاح القطاعي

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ملخص

يسعى هذا البحث لإبراز منظورين للتدقيق في دوافع المدير على جودة الإفصاح القطاعي من منظور الوكالة، ويهدف هذا البحث إلى إيجاد تأثير التكلفة التي يقوم بها المديرون كجزء من دافع الوكالة في الكشف عن المعلومات المتعلقة بقطاع الأعمال. إضافة إلى ذلك، يتناول هذا البحث إيجاد تأثير تنويع الأعمال كإشارة لتحديد جودة الإفصاح للقطاع، والعينة هي: الشركات العامة المدرجة في إندونيسيا. تم تحليل العلاقة بين المتغيرات باستخدام نموذج التأثير الثابت مع المربعات الصغرى المعممة بما في ذلك أوزان المقطع العرضي وفحصها باستخدام اختبارات المتانة. توصلت الدراسة إلى أن تأثير التكلفة التي يقوم بها المديرون إيجابي على مستوى جودة الإفصاح القطاعي. علاوة على ذلك، تشير النتائج إلى أن المديرين يستخدمون دافع الوكالة لتحسين جودة الإفصاح. ومن أهم النتائج أن التكاليف التي يتكبدونها من خلال تحويل الأموال عبر القطاعات تهدف إلى إدارة أداء القطاع غير الفعال. إلى جانب ذلك، بينت النتائج أن المديرين يستخدمون تنويع الأعمال كدافع مؤشر لتحفيز جودة القطاع. وأخيراً، توصلت الدراسة إلى وظيفة التفاعل بين الكمية والنوعية. وهذا يعني أن تحسين جودة الإفصاح المقطعي يعكس كمية أكبر.

الكلمات الدالة: الوكالة، الإفصاح القطاعي، الإشارة، الجودة، الكم.

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1. INTRODUCTION

The analysis of segment disclosures primarily relies on the effectiveness of standard implementation. The disclosures further would lead to the content of segment information provided by firms. IFRS 8 is the standard related to the disclosure of segment information, more informative for users of financial statements. It emphasizes management approaches presenting information to be relevant and consistent between internal and external parties (IASB, 2013). Segment disclosures based on the external perspective enable to provide more information. Lenormand & Touchais (2021) stated that management approaches encourage firms to change their segmentation by presenting a more economic perspective on the business.

In Indonesia, segment information is standardized in PSAK 5 based on IFRS 8. In this standard, all entities make financial reporting structures of business segment appropriate for the management approach. This segment disclosure provides the space to be analyzed in the aspect of manager behaviors. The policy to increase or limit the segment information may be interesting to trace when firms are confronted by the standard. The segment report should be concurrent in the external and internal presence in firms and made by operational decision makers, such as Chief Executive Officer (CEO) or executive directors. The problem of this case is that the decision to disclose the content of a segment is not only depending on the applied standard, but also on the manager's behavior. Bens et al. (2011) stated that pseudo-segment characteristics tend more discretionary to be managed after the standard is applicable. They found that companies with multi-segments indicate that the disclosure behavior is more strategic to be managed compared to companies with a single segment.

Furthermore, the quality of the disclosure relies on the choice of managers, particularly for protecting less profitable segments. It encourages managers to be able to mask bad performances in certain segments (Botosan & Stanford, 2005). Therefore, the choice of managing the content of segment information will be analyzed in this research as the part of disclosure strategy made by managers. Prior studies have linked the disclosure of segments with the firm characteristics (Al-Zwaylif & Hajjaj, 2018; Hidayat & Vestari, 2021; Ibrahim, 2014; Izzaty & Pujiastuti, 2020; Lucchese & Di Carlo, 2016; Pardal et al., 2015; Tran et al., 2021). IFRS 8 has been recognized to lead the improvement of segment information. The decision to improve the segment performances has been addressed to the internal policy made by managers. From agency perspective, its motive can provide flexibility to increase the level of disclosure. The discretion of managers to choose the accounting policy as part of the behavior in affecting the level of disclosure may be confronted by agency cost where the segment disclosure under management approach IFRS 8 is more informative for the external purposes, so that the content of information can be easier to be analyzed from the agency perspective. In this perspective, the quality of segment information may tend to be motivated by the personal interest. The problem is opportunistic behavior arising due to moral hazard. The agency relationship encourages information asymmetry problems, because managers tend to be able to access more information than the principal. However, one of the strategies to align the information is transparency disclosure. The principal seeks to make it, but the consideration related to sensitive information becomes the reason for managers. Cost and benefit tend to make a trade-off in the agency motive. Therefore, the cost of the agency may be a determinant for the company to disclose segment information.

Most studies tended to analyze the impact of the application of operating segments after the application of IFRS 8. They found that it improves operating segments (Ashfaq et al., 2022; Kang & Gray, 2014; Lenormand & Touchais, 2021; Odia & Imagbe, 2015; Tran et al., 2021). This research comes up to find the

effect of the agency motive on segment disclosure. In addition, the segment information has also been made as one of the specific disclosures in annual financial statements. Investors will be interested in investing if the company discloses the segment as a signal for them, so that they may obtain the uncertainty about information received. So, the signals provided by firms are required. The external users certainly need a signal more informative to see them.

This research takes a stance by understanding that mandatory rules make segment disclosure predetermined by the regulation. However, the company can actually either diminish or improve the quality of segment disclosure, so that the stakeholders obtain more informative signals and the firms gain the merit. Therefore, the objective of this research is to examine the effect of costs made by managers and business diversification on segment disclosure.

The disclosure in this research is identified from the content of quality, because it is so far constructed using the disclosure index by prior studies. The assessment of quality may not be conducted by an approach adopting the number of items, because quality is an intrinsically complex measurement (Beretta & Bozzolan, 2008). The level of disclosure based on the number of items is generally employed by them (Deceuninck, 2009; Ibrahim, 2014; Kang & Gray, 2014; Kopecká, 2016; Lucchese & Di Carlo, 2016; Mardini et al., 2012; Pardal et al., 2015; Schvirck et al., 2013; Tran et al., 2021; Valenza & Heem, 2010). However, segment aggregation with similarly economical characteristics can't be reached by the use of a disclosure index. Two or more segments with similar characteristics in the context of the nature of products, services, and productions, and the type of similar customers, can be aggregated into a single segment. This case can only be identified using the representative function to obtain masked information in the aggregated segments. This research uses the function of profitability variation. The aggregated segments trigger the variation in profitability, so that the content of segment information can be assessed clearly. In addition, this research allows the function of quantity to substitute the quality function with the purpose of providing stable and insensitive results. Therefore, this research employs sensitivity analysis to obtain the results.

This research contributes to the comprehension of the cost behavior and financial standard in terms of operating segments. It provides notes that the manager has considerable motives to manage the reported segment performance and becomes a particularly interesting area related to the motives of managers in presenting the business segment for financial reporting purposes. It is found that segment costs made by managers and the level of business diversification are regarded to have effects on segment disclosure. The finding of this research also becomes feedback given to standard setters. From the agency perspective, this research can assess that the implementation of a standard actually leads managers to think strategically in making a policy related to disclosure. This research sheds additional light on the tenet of agency and signaling theory which can be served as a framework for understanding managerial perspectives. In the process, this research then contributes to a better paradigm in the function of quantity replacing quality in the context of segment disclosure where the interplay function between quantity and quality is found.

This research is organized as follows. Further sections present literature review, followed by the development of hypotheses, methodology describing data and sample, variables and data analysis, as well as results and discussion. This research ends with a conclusion containing the implications and suggestions for future studies.

2. Literature Review

2.1 Agency Motive

The concept of an agency stated by Jensen & Meckling (1976) fundamentally implies that an agency

relationship describes a contract between one or more considered as the principal and the person employed as an agent. The agency problem relates to principal and agent. The principal is an owner or shareholder, while the agent is a manager working to undertake the enterprise with the purpose of maximizing the welfare of the entity. The manager is sometimes confronted by interest conflict so as to gain more profit. DeAngelo (1986) stated that agency theory emphasizes accounting numbers as the conflict between companies and managers.

The existing separation between ownership and enterprise management leads to the agency problem. The principal as the owner doesn't have the managerial competence in undertaking the operational activity. So, the manager is mandated to help him/her. Agency theory is used to understand a principal-manager relationship. It can create information asymmetry if managers as agents have the conflict of interest with their principal. From the opportunistic view, they seek to maximize their utility (Kazemian & Sanusi, 2015) with the management of earnings for the reporting resulting in the decline of firm value (Al-Shattarat et al., 2022; Chakroun et al., 2022) and the negative effect on the disclosure (Ehsan et al., 2022). The interest between managers and principals can be aligned. The economic advantages for the owner in a principal-steward relationship result from lower transaction costs related to the economic incentives. Accounting information can align the relationship between the principal and the manager. It can be determined by the policy of accounting under the moral hazard of managers. Jiraporn et al. (2008) stated that agency theory serves as a means of distinguishing the opportunistic and beneficial behaviors of managers. In the beneficial perspective, managerial discretions are used to provide a latitude to adjust the earnings and the communication relationship tends to be improved. As a result, the agent is not destructive to the shareholder value. The role of monitoring aids to increase the quality of disclosed financial information (Anwar & Buvanendra, 2019).

Furthermore, Jensen & Meckling (1976) posit cost agency as the sum of monitoring expenditures by the principal, bonding by the agent, and residual loss expenditures. The principal can limit the divergence of its interests by making appropriate incentives for the agent and by giving monitoring costs designed to limit aberrant activity. Besides, it will shell out the agent to develop resources (bonding costs) for guaranteeing that he/she will not act to harm the principal. On the other hand, the cost is used to mitigate issues associated with the agent using more information to be able to align the interests with the principal, such as executive compensation with the equity payments given through stock options. Schroeder (2010) considered bonding costs as an incentive owned by managers to act in accordance with shareholder purposes. In the principal-agent relationship, losses may be suffered by the principal, because the decision made by agents has performances with the value of low output (residual loss). It has to be mitigated by the principal. To press it, the principal should incur monitoring and bonding costs (Williamson, 1988). Depken et al. (2006) concluded empirically that the influence of bonding costs lowers the agency cost. Ang et al. (2000) stated that when the management has less than 100 percent of the company's equity, the shareholder imposes the agency cost to enhance firm earnings.

A principal-agent relationship drives information asymmetry problems. Managers can actually access more information than owners. In addition, regulation through disclosure is a means of mitigating agency problems through more information disclosed by managers, thereby reducing the cost (Healy & Palepu, 2001). Aboud & Roberts (2018) stated that agency costs have the role to determine the quality of segment disclosure. In the tenet of agency costs, principals sometimes incur costs to align the information. Segment disclosure plays a pivotal role in reducing

agency conflicts between principals and agents. Bens et al. (2011) found that segment disclosures identified from the agency motive can restrict the manager's latitude to reveal the segment information. In prior research, Berger and Hann (2007) stated that managers confront the agency cost to determine the segment profit. When the agency motive dominates, they tend to withhold the segment with relatively low abnormal profit.

Leung & Verriest (2019) stated that agency cost is necessary for making the decision, whether information related to segment profitability should be disclosed or masked. The cost is marked using inefficient transfers and drives segments with unstable valuations (lower or higher). You (2014) found that segments with relatively high valuations have reported high abnormal profits in companies involved in manipulating the segment's financial information.

The quality of segment disclosure can be assessed informatively on the financial statements. The content of profitability is provided by management decisions. Managers obtaining inefficient transfers elicit the agency cost to hide segment data. Aggregation changes from one segment are reported to another segment or managers can transfer the expense from one segment to another and ensure that such condition can be performed without vision changes, so segment disclosure is more easily discretionary (Lail et al., 2014; You, 2014). Managers gaining more profit from agency cost will find the difficulty to convey differences in earnings growth across segments. Wang et al. (2011) concluded that agency costs are negatively associated with the level of inter-segment earnings profitability. In this perspective, managers behave opportunistically. The agency-cost hypothesis states that managers have incentives to make decisions in their favor (Ang et al., 2000; Hope & Thomas, 2008; Jensen, 1986; Jensen, 2009). It creates agency motive in the strategic report presenting insufficient financial information. The moral hazard of agency problems seeks to create incentives for managers to lower the quality of segment disclosure. The manager may not work unless he/she is motivated due to more incentives given by the principal (Scott, 2015). When companies suffer from bad financial performance, managers may want to mask it by improperly aggregating the operating segments. They smooth segments reported so as to mask bad decisions on the performance.

Furthermore, managers with a high-cost agency can determine the quality of the segment disclosure. They tend to use their discretion to manage the segment profit with the purpose of gaining the incentive of the agency cost. The higher the inter-segment transfers, the higher the quality of segment disclosure indicated by the declining variability of the growth of segment profitability. Thus, the quality of business diversification disclosure is determined by agency motive through agency cost. It reveals that the agency cost made by managers' attempts to enhance the content of segment information. Hence, the first hypothesis (H1) in this research is that agency motive through the cost made by managers positively determines the reported segment quality:

H1: Agency motive exerts a significantly positive effect on the quality of segment disclosure.

2.2 Signaling Motive

From a signaling perspective, Akerlof (1970) described that the signaling model is initiated by sellers assumed to have more information about their products than buyers. Like agency theory, the problem of information asymmetry is a basic assumption of signaling theory, but it occurs between seller and buyer. When the seller knows more regarding the product than the buyer, the signaling theory shows how information asymmetry can be obtained by external parties through available signals. The problem of reduced information asymmetry is characterized by companies sending signals to investors through disclosure to show that they are better than others in the market, so that they can improve their reputations

resulting in an increase in investment.

Companies may disclose much more information to create good signals for investors (Shehata, 2014). The theory of signal can be used in assessing segment information through disclosure (Hunziker, 2019). When companies reveal less information, they may seem to conceal their performance. In addition, since the content of segment information under IFRS 8 has been essential to adopt, the standard of PSAK 5 regarding operating segment should be revised as a fulfillment of needs for the user of financial statements. The implementation of IFRS 8 provides relevant information between internal presentation and external reporting, so that it encourages the improvement of the quality of the disclosure. The management approach as part of one of the main bases of IFRS 8 has the purpose of increasing the relevance of disclosure information. Entities with multiple segments allow transparency, because the performance of the business segment will affect the overall performance of the company.

Furthermore, the company is able to improve the quality of the segment information when its business is increasingly diversified. Most scholars have shown that the number of segments increased after the adoption of IFRS 8 (Ashfaq et al., 2022; Mardini et al., 2012; Nichols et al., 2012; Tran et al., 2021). The increasing number of segments tends to signal an improved quality of segment disclosure, where the level of business segment signals segment variance in profitability. The external parties not only need information regarding the general activities of the company, but they also need information on the segment. Business diversifications for reporting purposes assist external parties in adequately selecting each company. Business diversification is an indicator in looking at the quality of disclosure (André et al., 2016; Blanco et al, 2014). This signal can be identified through business diversification. It means that the disclosure may be determined by business diversification. Since companies have a number of business diversifications, the business segment is necessary to be highlighted. Companies with total heterogeneous segments may lead a better disclosure quality. This research includes business diversification as a determinant of segment disclosure. As a result, the second hypothesis (H2) implies that the quality of business diversification disclosure is determined by signaling motive through the number of business diversifications.

H2: Signaling motive exerts a significantly positive effect on the quality of segment disclosure.

3. Methodology

3.1 Sample and Data

The convergence of IFRS 8 into PSAK 5 was effectively applied in 2012. This research collected 436 firms listed over the period from 2012 to 2018. All companies listed in Indonesia through Indonesian Stock Exchange were selected using a purposive sampling procedure. The strategy of the disclosure can be traced to multi-segment firms, so that this research eliminates a single operating segment. The final sample was 187 firms after eliminating inconsistent listed firms during the observation period, firms with a single operating segment and firms with unavailable financial statements' data. Selected firms further composed of 45 industry firms (basic industry and chemical, miscellaneous industry, and consumer goods' industry) and 142 non-industry firms (agriculture, mining, property real estate, building construction, infrastructure, utilities, and transportation, as well as finance, trade, service, and investment). Financial statements on each firm over the period from 2012 to 2018 were collected and analyzed to obtain research data. As a result, research data generated 1,309 observations.

3.2 Research Variables

This research employed independent and dependent variables. Quality of segment disclosure served as the dependent variable, while manager motives were independent variables in this research.

This research also included a control variable in the research model.

3.3 Segment Disclosure Quality

The quality of segment disclosure (QLSEG) denotes the content of segment information disclosed by the firm identified based on profitability. The requirement of IFRS 8 provides much more information for dealing with operating segments owing to the emphasis on management approach. The financial statements' dimension provides aggregation of clarity (André et al., 2016; Gotti, 2016), because the segment aggregation under IFRS 8 contains variability in segment-level profitability. This research used the cross-segment variation in profitability as the proxy of segment disclosure. André et al. (2016) adjusted the measurement from Ettredge et al. (2006) using cross-segment profit variability. They included industry-level ROA weighted by the proportion of total assets distributed to each segment. This way was also adopted by Lail et al. (2014). It was measured using the logarithm from adjusted ROA as shown in the following formula:

$$\text{AdjROA}_{s,i} = (\text{ROA}_{s,i} - \text{IndustryROA}_{s}) \times \frac{\text{Aset}_{s,i}}{\text{Total Aset}_{i}}$$

$$\text{QLSEG} = \text{Log}\,(2 + \text{Max AdjROA}_{s,i} - \text{Min AdjROA}_{s,i})$$

Proper segment aggregations create variation in the disclosed segment's profitability. If reported segments have improper aggregations, managers will manage them by smoothing cross-segment profitability. It means the more varied the growth of profitability, the higher the segment performance quality.

3.4 Manager Motives

The research considers managers' motives from the agency and signaling perspectives in affecting the content of segment information. Cost is a primary earnings component that can be researched in the behavior aspect (Bu et al, 2015). Under the tenet of agency theory, a principal-agent relationship triggers the asymmetry of information resulting in the agency cost. The purpose of the cost is to align information between agents and principals. This research follows the fundamental postulate implied by Jensen (1986) that the total agency cost is the sum of monitoring and bonding costs accompanied by loss value. In the segment content, it can be proxied using loss transfers across segments. Losses are imposed on the principal due to decisions made by agents obtaining the performance with low output values.

The existing agency costs in the context of operating segments are made through cross-segment funding transfers. Changes to the disaggregation magnitude lead to a shift in the level of disclosure. Berger & Hann (2003) identified the tendency for cross-segment fund transfers based on the number of loss segments, because loss segments can be stored longer in a multi-segment, so that managers tend to make it discretionary. Therefore, agency costs in this research are measured from the transfer of funds across segments (COST). The result of COST indicates that the higher the number of loss segments, the more masked segment information.

Zalloum (2021) stated that managers can diversify their products by using the optimum level of diversification. In a signaling motive, this research uses a proxy of Business Diversification (BD) as the signal provided by managers to notify investors and creditors that their segments determine the quality of disclosure. Since operating segment based on a management approach is applied, it is necessary to disclose business diversification. Companies should report the number of heterogenous segments, so business diversification can be served as a motive to signal the quality of the segment. Business diversification is the diversity of business activities developed by firms to gain more profit. It is measured using the number of business segments presented by managers in financial statements.

3.5 Control Variable

A control variable was included in controlling the nexus between multiple variables. It was also used to control different factors so as to help explain variance in dependent variables. Foss et al. (2000) implied that the company has become a crucial part of a series of economic explanatory factors, for instance, in the theory of financial performance, the characteristics of firms fundamentally have to be included due to help trace the influence of endogenous variables on exogenous variable changes. Some studies utilized the size of the company to adjust the main variable (Al-Nashef & Saaydah, 2021; Bouqalieh, 2023). This research used firm size (SIZE) due to the possible existence of all types of businesses. Firm size is measured using the natural logarithm of total assets owned by firms.

3.6 Data Analysis

The nexus between variables has been tested using a suitable regression model. Panel data requires the selection of the effect model (common, fixed, or random). This research also used robustness checks to confirm that the results of the model were robust to any change to the input. The basic equation for beginning to regress panel data is written as follows:

QLSEG = f (COST, BD, SIZE)

where,

QLSEG = Quality of Segment Disclosure

COST = Agency Cost

BD= Business Diversification

SIZE= Firm Size

4. Results

4.1 Descriptive Statistics

QLSEG as the dependent variable denotes the content of segment information reported by firms. It is measured based on the variability in segment-level ROA.

As shown in Table 1, from 187 firms with 1,309 observations in column 1, the mean value obtained by the sample firm is 0.852, indicating higher variability in segment profitability. At the maximum value, firms have reached 1.850, where the higher the value of variation in the segment profitability, the greater the segment performance quality. At the minimum value, the variability of cross-segment profitability reported by firms was 0.601.

Furthermore, COST as a proxy of agency motive has a mean value of 0.902, indicating the number of loss segments suffered by firms. The recorded value shows that some firms suffer losses in segment performance. As presented in column 3 in Table 1, some firms suffer loss segment four times (see at maximum value). In turn, there are firms with no loss in segment performance (see at minimum value). Nonetheless, this research observes that loss segments are suffered each period by the same sample firms. Another independent variable is business diversification (BD). On average, firms have four diversifications. They have two diversifications at least and eleven diversifications at most. Related to firm size (SIZE), average firms have a size of 8.720 in natural logarithm, with 16.030 at maximum value and 1.960 at minimum value.

4.2 Model Fit Test

Panel data regression analysis is checked diagnostic using the test of common, fixed, and random effect models.

In Table 2, all regression models show the same significance on the nexus between independent variables (COST, BD, and SIZE) and a dependent variable (QLSEG). This research initially checks those models using the Chow test. The result shows that the value of the Chow test is 5.519 with significance at the 0.01 level. It means that the regression fit is in the fixed effect model. Thus, fixed regression analysis is used to test the hypotheses of the research.

Table 1

Descriptive statistics

Variable	N	Mean	Max.	Min.
QLSEG (Quality of Segment Disclosure)	1309	0.852	1.850	0.601
COST (Agency Cost)	1309	0.902	4.000	0.000
BD (Business Diversification)	1309	4.277	11.000	2.000
SIZE (Firm Size)	1309	8.720	16.030	1.960

Source: Author's own work.

Table 2

Regression model selection

Regressors	Common Effect	Fixed Effect	Random Effect
Constant	0.756 53.210***	0.530 22.671***	0.695 41.074***
COST	0.052 13.050***	0.019 3.827***	0.048 12.701***
BD	0.008 3.859***	0.069 12.577***	0.021 7.343***
SIZE	0.002 1.201	0.001 0.553	0.002 1.427
R-squared	0.157	0.157	0.234
Adjusted R-squared	0.155	0.155	0.232
F-statistic	81.204***	81.204***	133.042***
Chow Test		5.519***	
Hausman Test		112.077***	
Observations	1309	1309	1309

Significance level at ***1%, **5%, *10%.

Note (s): This table shows panel data regressions generating common, fixed, and random effects. The dependent variable quality of segment disclosure (QLSEG) and the independent variables are agency cost (COST) and business diversification (BD) with firm size (SIZE) acting as a control variable.

Source: Author's own work.

This research further selects the most appropriate model whether using fixed or random effect estimations through the Hausman test. Based on Table 2, the result shows 112.077 with the probability value at the 0.01 level, so in this regard, the fixed effect model is employed in this research to estimate the nexus between independent and dependent variables.

4.3 Fixed Effect Regression Analysis and the Results of Hypothesis Testing

Fixed effect regression is a suitable model in this research, so a time-fixed effect model is used to test the hypotheses. Diagnostic checks for assumptions have

no multicollinearity and any autocorrelation, but the model obtains the problem of heteroscedasticity. The model has values less than 0.8, indicating no multicollinearity. Because panel data contains time series, the model should check Durbin-Watson and the probability value through Run Test. The model is far from 2 with the probability value at the 1% level, so it shows the problem of autocorrelation as shown in Panel A in Table 3. The last assumption is heteroscedasticity. The model obtains 4524.64 through the Breusch-Pagan test at the 0.01 level. In this regard, the value also shows the problem of heteroscedasticity. As a consequence, owing to heteroscedasticity and autocorrelation problems, hypothesis testing used a fixed effect model with GLS weights.

The result of GLS in Panel C shows the positive effects at the 0.01level made by independent variables (COST and BD) on the dependent variable (QLSEG) in the model, while firm size (SIZE) as a control variable has no significant effect at all levels. At the coefficient of determination, the adjusted R-squared obtains 0.640, disclosing that 64% of the data fit the regression model. The result of the model also shows simultaneous effects of regressors on the dependent variable through F-statistic of 13.313 significant at the 1% level. As a result of the goodness of fit test, this research accepts the two hypotheses (H1 and H2), implying that manager motives have positive effects on the quality of business segment disclosure.

Table 3

Fixed effect regression

Panel A. Fixed Effect Model			
Regressor		Coefficient	t-statistic
Constant		0.530	22.671***
COST		0.020	3.827***
BD		0.069	12.577***
SIZE		0.001	0.553
R-squared		0.560	
Adjusted R-squared		0.486	
F-statistic		7.550***	
Panel B. Diagnostic Test			
	NLSEG	NSEG	SIZE
COST	1.000	0.307	0.011
BD	0.307	1.000	0.168
SIZE	0.011	0.168	1.000
Breusch-Pagan		4524.64	
The probability value		0.000	
Durbin-Watson stat.		3.389	
The probability value through Run Test		0.000	
Panel C. Generalized Least Squares			
Regressor		Coefficient	t-statistic
Constant		0.490	30.455***

COST	0.024	6.719***
BD	0.078	19.670***
SIZE	0.001	0.282
R-squared	0.692	
Adjusted R-squared	0.640	
F-statistic	13.313***	

***Significant at 1%, **Significant at 5%, *Significant at 10%.

Notes: This table shows panel data regressions generating common, fixed, and random effects. The dependent variable is quality of segment disclosure (QLSEG) and the independent variables are agency cost (COST) and business diversification (BD) with a control variable of firm size (SIZE).

Source: Author's own work.

4.4 Robustness Test

A robustness check is run in this research with the purpose of ensuring that the research model is not highly determined by changes to a dataset and remains robust. If there is any change in the inputs, our model will capture it. This research then splits the sample into industry and non-industry types and re-estimates each equation model. The sample has 187 firms composed of 45 industries and 142 non-industries with 315 and 994 observations, respectively.

In the model selection, Chow and Hausman tests show significant values at the 0.01 level. Thus, fixed effect regression is a suitable model. Afterwards, this research runs all models using GLS regression. In Table 4, the results show the positive effects of independent variables (COST and BD) on the dependent variable (QLSEG) at the 1% significance level, while the control variable (SIZE) shows no effect at all significance levels. At the coefficient of determination in all models, the results of adjusted R-squared remain 66.3% and 62.9%, respectively, in industry and non-industry samples. Those values are not far from the value of the model with a full sample of 64%, while the results of testing F-statistic remain significant at all levels. In addition to the robustness check, Robust Least Squares (ROBUSTLS) and Generalized Method of Moment (GMM) for dynamic panel data are also analyzed. These results in Table 4 show that regressors (COST, BV, and SIZE) in all models have the same sign and effect on the dependent variable (QLSEG). At the coefficient of determination, the equation model can be explained by regressors respectively of 32.9 percent, 34.1 percent and 33 percent. The fit model of the robustness tests (ROBUSTLS and GMM) also shows significant probability values of simultaneous effects of regressors on the dependent variable. It indicates a good model for the estimation of the nexus between variables. Overall, its effect is more robust across various changes to datasets and the magnitude of the sample. In other words, the design of the model in terms of the use of a split sample remains consistent with the model of a full sample.

Table 4

Robustness check

Regressor	***Full Sample***			***Industry***			***Non-industry***		
	GLS	***ROBUSTLS***	***GMM***	***GLS***	***ROBUSTLS***	***GMM***	***GLS***	***ROBUSTLS***	***GMM***
NLSEG	*0.024* (6.719) ***	0.057 18.674***	-0.031 6.615***	0.023 (2.972) ***	0.055 8.912***	0.023 2.812**	0.025 (5.944) ***	0.057 16.404***	0.032 6.383***
NSEG	0.078 (19.670) ***	0.008 5.403***	0.096 16.394***	0.082 (9.893) ***	0.011 3.776***	0.1289 11.891***	0.077 (16.911) ***	0.007 4.051***	0.088 13.945***
SIZE	0.001 (0.281)	0.002 1.867	-0.002 -0.775	-0.000 (-0.076)	-0.000 -0.106	-0.000 -0.118	0.000 (0.379)	0.003 2.327**	-0.001 -0.407
Lag QSEG			-0.359 -14.259***			-0.558 -11.895***			-0.313 (-13.768) ***
Constant	*0.490* (30.455) ***	0.732 68.282***		0.499 (15.506) ***	0.746 33.449***		0.487 (26.107) ***	0.727 59.139***	
R-squared	0.692	0.208		0.714	0.220		0.683	0.206	
Rw-squared		0.329			0.342			0.330	
Adjusted R-squared	0.640	0.207		0.663	0.213		0.629	0.204	
Adjust Rw-squared		0.329			0.341			0.330	
Rn-squared statistic		497.478***			122.284***			377.927***	
F-statistic	13.313 ***			12.941 ***			12.621***		
J-statistic			171.135***			44.570***			131.497***

***Significant at 1%, **Significant at 5%, *Significant at 10%.

Note (s): Having selected an appropriate effect model, fixed effect model with GLS weights is run for each equation. Robustness tests are also run to obtain robust results and consistent effects through Robust Least Squares (ROBUSTLS) and Generalized Method of Moment (GMM) estimator involving GLS and IV GMM weights.

The dependent variable is the quality of segment disclosure (QLSEG) and the independent variables are agency cost (COST) and business diversification (BD), and the control variable is firm size (SIZE).

The t-statistics in parentheses are with significance levels, at ***0.01, **0.05, and *0.10.

Source: Author's own work.

Table 5

Sensitivity analysis

Regressor	***Fit Model Selection***			***Robustness Test***	
	Common Effect	**Fixed Effect**	**Random Effect**	***ROBUSTLS***	***GMM***
Constant	0.567 (47.397) ***	0.511 (25.099) ***	0.545 (36.871) ***	0.616 (57.457) ***	
COST	0.014 (4.359) ***	0.008 (1.903) *	0.013 (4.026) ***	0.009 (3.088) ***	0.039 (5.934)***
BD	0.060 (35.402) ***	0.004 (14.559) ***	0.062 (23.782) ***	0.056 (36.864) ***	0.035 (6.983)***
SIZE	0.001 (1.390)	0.004 (2.655) ***	0.003 (2.435) **	0.000 0.079	-0.001 (-2.032)
QNSEG					0.015 (0.687)
R-squared	0.549	0.747		0.399	
Adjusted R-squared	0.545	0.705		0.579	
F-statistic	524.681 ***	17.549 ***			
Chow Test		4.792 ***			
Hausman Test			5.787		
Lagrange Multiplier (LM) Test			479.294***		
Rw-squared				0.399	

Adjusted Rw-squared				0.579	
Rn-squared statistic				1636.796***	
J-statistic					12.226
Observations	1309	1309	1309	1309	1309

Notes*:* The dependent variable is the quantity of segment disclosure (QNSEG) and the independent variables are agency cost (COST) and business diversification (BD) with a control variable of firm size (SIZE). The result of Chow test shows significance at the 1% level, while Hausman test shows no significance at the 1% level. LM test then is run through Breusch-Pagan approach. The result shows significance at the 1% level. Consequently, the random effect model is employed to regress the equation. Afterwards, robustness tests are employed through ROBUSTLS and GMM for dynamic panel data.
The t-statistics in parentheses are with significance level at ***0.01, **0.05, and *0.10.

Source: Author's own work.

5. Discussion

5.1 Agency Motive and Signaling Motive behind the Quality of Business Segment Disclosure

Prior scholars (Bens et al., 2011; Berger & Hann, 2007; Wang et al., 2011; You, 2014) implied that segment disclosure motive can be affected by the agency cost. The result of this research also shows the significant effect of agency cost on disclosure in the context of segment quality. As a result of testing the hypotheses, COST has a positive effect on QLSEG. It accepts H1 stating that agency motive exerts a significantly positive effect on the quality of segment disclosure. Agency cost determines the quality of segment disclosure. Its effect leads to an increase in the quality.

The opportunistic behavior of managers can't influence segment performance, but the efficient behavior embraced by managers affects it. In an efficient managerial behavior, practices of managing earnings can be good if used responsibly. It does not matter when no requirement of the rule is broken (Jooste, 2011). A positive effect of agency cost occurs as managers' discretion intends to improve inefficient segment performance. They tend to smooth operating segments, so that each segment shows stable profitability. When firms have segments with bad performances, they tend to manage them to look smoother. Berger & Hann (2007) stated that loss segments can remain longer. Therefore, firms with multi-segments should fund their losses. When segments with bad quality are subsidized, the level of cross-segment growth creates a variation in profitability.

Managers can disclose the best quality of segment information through the segment management approach. Segment performances tend to be managed as a part of agency motive. As a result, the agency cost as the proxy can't decrease the quality of the segment, but the purpose is to increase it. Under agency theory, this research justifies the consideration and discretion made by managers to choose accounting policies to report their performance. From an efficient perspective, they tend to display their firm with good performance. The total agency costs (the aggregate of monitoring, bonding, and loss value) are incurred, because in this situation the benefits have been given to the principal-manager relationships. The agency cost hypothesis posits that managers have the incentive to make decisions in their favor (Hope & Thomas, 2008; Jensen, 1986) and the principal under the improvement of corporate governance incurs the cost to cope with it, because the effect of corporate governance in this regard has a positive impact on the increase of information in segment reporting (Tran et al., 2021). Thus, the quality of segments relies on the level of discretion made by managers in line with the perspective of Lail et al. (2014), demonstrating that the more improved the quality of information, the better the disclosure, because firms accept more incentives.

This research further finds that the improved disclosure quality is also empirically determined by the signaling motive. The result of this research accepts H2 outlining that signaling motive exerts a significantly positive effect on the quality of segment disclosure.

The extent of business diversification enhances the improvement of quality. Under IFRS 8, segment disclosure leads managers to provide the quality of segment reporting. Its management approach tends to affect the manager's policy in making decisions to segment aggregations. As stated by Lenormand & Touchasis (2021), the approach under IFRS 8 provides a more economic view of the business.

The signal theory is elaborated to confirm the positive effect of business diversification on segment disclosure quality. In the framework of signal theory, business diversification can serve as a more informative signal in understanding the quality of company segments. Under the tenet of IFRS 8, it provides an influence on the increase in the number of segments disclosed. The more informative the business segments, the more the quality of segment disclosure improves. It contains a high variability in the growth of segment profitability, so that the extent of diversification is more decisive in improving the quality of segment disclosure. As a result, the level of business diversification is embraced by the manager as a signaling motive in notifying the segment information to the investor.

Furthermore, the operating segment under IFRS 8 is more informative for external purposes, because the decision to provide the segment information is given as an option to the manager. Such an option can be determined by the manager for reporting purposes. For instance, the criteria of the reported segment must meet a quantitative threshold with one of the requirements of more than 10% of the total revenue of the business segment. In this regard, it can condition that if the segment doesn't meet the threshold, managers can disclose it by taking into account that the management ensures that the information can be useful to external users. By understanding these options, the level of segment reporting can be a signal to all users. As a result, the increase in the level disclosed by firms is determined by business diversification. When users want to obtain improved segment quality, the simple signal is by seeing the increasing business diversification.

5.2 Sensitivity Analysis

While robustness test relates to the model design taking into account the necessary assumptions, sensitivity test should also be run to deal with stable findings. This research actually utilizes quality as the parameter to determine the content of masked segment information. Manager motive through agency cost actually can be exercised over quality. This research fundamentally follows Berger & Hann (2007) as well as Franco et al. (2016), implying that managerial discretion can be more undertaken over the quality than the quantity. Nonetheless, some studies make a clear distinction between the quality and quantity in the context of disclosure. Beretta & Bozzolan (2008) disputed that quantity can be a sound parameter for the quality of disclosure. Meanwhile, the quantity of the number of accounting items disclosed may be assumed as a simple approach instead of quality considered as a complex measurement. Rennie & Emmanuel (1992) stated that the disclosure can be assessed by considering two natures, including quantity and quality. Both measurements can be a signal to notify the stakeholder and used simultaneously or separately (Li & McConomy, 2004). For this reason, a research should run a sensitivity analysis taking into consideration another parameter possibly affecting the output and the stability of the findings.

Two levels of key business segments are required by PASK 5 on the basis of IFRS 8. The first level consists of three items, including 1) general information; 2) information regarding profit or loss, assets and liabilities; and 3) reconciliations related to segment revenues, segment profit or loss, segment assets and liabilities, and other material segment items. The last level contains information consisting of 4) products and services; 5) geographical areas; and 6) major customers. Overall, six items comprise the parameter to assess the quantity of segment disclosures.

This research examines whether the result remains consistent after changing the dependent variable proxy. The model further substitutes the quality with the quantity measured using the index of disclosure obtained from the comparison between the number of items disclosed and the total items required (six items). The result of the model of quantity of segment information using disclosure index as a dependent variable is presented in Table 5. This research already selects the model suitable for the data. Of the result of the selection model, it obtains random effects. Afterwards, robustness check is conducted using ROBUSTLS and GMM for dynamic panel data. All independent variables (COST, BD, and SIZE) show the same sign and effect. Related to GMM, the result is an insignificant positive coefficient and J-statistic. It indicates unfit in the goodness test implying that the result of the model shows no simultaneous effects of regressors on the quantity. In this regard, the model may need no use of dynamic panel model through GMM. Nonetheless, all regression models (random effect model and robust-effect model show the same significance on the nexus between the independent variables (COST, BD, and SIZE) and the dependent variable (QNSEG). Overall, the result of sensitivity analysis remains significant across two regressors (agency cost and diversification variables).

Having obtained similar results in the sensitivity check, this research further analyzes the correlation and the interplay between quantity and quality following the pattern of prior scholars (André et al., 2016; Beretta & Bozzolan, 2008; Blanco et al., 2014) in the context of the disclosure. The correlation analysis of quantity (QNSEG) with the quality (QLSEG) is shown in Table 6 in Panel A. The index of disclosure quantity is correlated to the quality significantly. This research further runs Two Stage Least Squares (2SLS) in Panel B. The regression model shows that there is an association between quantity and quality. The result of this model indicates that both functions have an interplay.

The quantity is a common proxy to provide segment information when firms have diversified segments (Blanco et al., 2014), while the quality can be a complex proxy due to tracing the segment content. However, both can be relevant proxies in the context of the segment assessment as found in this research. Finally, the interplay between quantity and quality implies that manager motives can also be found when companies disclose segment information quantitively and qualitatively.

Table 6
The interplay between quantity and quality

Panel A. Partial and semi-partial correlations of QNSEG with QLSEG, COST, BD, and SIZE				
Variable	Partial	Semi-partial	Prob. Value	
QLSEG	0.074	0.049	0.007	
COST	0.088	0.654	0.001	
BD	0.700	0.024	0.000	
SIZE	0.037	0.049	0.176	
Panel B. Two stage least squares				
Model	Fixed Effect-GLS weights		ROBUSTLS	
Regressor	QNSEG	QLSEG	QNSEG	QLSEG
Constant	0.743 (68.215) ***	0.444 (34.871) ***	0.658 (25.586) ***	0.668 (39.407) ***

QLSEG	0.126 (9.966) ***		0.236 (7.922) ***	
QNSEG		0.479 (32.301) ***		0.201 (10.274) ***
R-squared	0.905	0.626		0.063
Adjusted R-squared	0.890	0.564		0.062
Rwsquared				0.094
Adjusted Rw-squared				0.094
F-statistic	57.701***	10.067 ***		
Rn-squared				105.556 ***

***Significant at 1%, **Significant at 5%, *Significant at 10%.

Notes: The result of Chow and Hausman tests show significance at the 1% level; so, fixed effect model is employed to regress the interplay between QNSEG and QLSEG. Afterwards, robustness tests are employed through ROBUSTLS. The t-statistics in parentheses are with significance levels at ***0.01, **0.05, and *0.10.

Source: Author's own work.

6. Conclusion

The main objective of this research is to find the effect of costs made by managers and the level of business diversification on segment disclosure. This research posits the theory of agency and signaling. As a part of the agency perspective, the manager utilizes the segment cost to set less profitable performances. It is found that the cost made by managers through the transfer of funds of cross segments intends to manage the inefficient segment performances. The improved quality of segment disclosure reflects the increasing variation of cross-segment profitability after being affected by the agency cost. The segment with loss performance contains a more varied growth of profitability, implying that the manager uses the transfer of funds across segments to enhance the quality of the reported segment. Furthermore, under a signaling motive, this research finds that the quality of business segment disclosures is determined by the number of business diversifications. It points out that business diversifications owned by firms can be considered a signal to determine the quality of business segment disclosure. This research has also conducted the test of the interplay between quantity and quality functions. In this regard, it documents the interplay function between quality and quantity of the segment information disclosed.

Related to research implications, a principal-manager relationship incurs the cost that must be paid by the principal with the purpose of leading the performance, so that the management must behave efficiently to set the disclosed business segment performance. The findings of this research could change the paradigm with respect to the disclosure tenet. Firms disclosing larger quantities and varied cross-segment profitability contents are empirically determined by the agency and signaling motives. It is addressed to standard setters where they have begun working in the context of the disclosure. The evaluation of segment disclosure quality made by this research is also useful to support the effectivity of operating segment standard converged in Indonesia as PSAK 5 under the revised edition following IFRS 8. Related to the practice implications, the analysis of segment disclosure quality and quantity provides business segment performance information. The findings of this research could be beneficial for the management in making decisions, while investors

obtain information regarding the way in determining the disclosure of business segment. For future studies, research should be extended to other manager motives in the context of segment information.

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