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The determinants of anti-corruption disclosure: Research on Indonesia Stock Exchange

Anitaria Siregar[1]
Etty Murwaningsari[2+]
Regina Jansen Arsjah[3]

[1,2,3]*Faculty of Economics and Business, Trisakti University, Jakarta, Indonesia.*
[1]*Email: anitaria221022004002@std.trisakti.ac.id*
[2]*Email: etty.murwaningsari@trisakti.ac.id*
[3]*Email: regina.arsjah@trisakti.ac.id*

(+ Corresponding author)

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ABSTRACT

This research aims to examine and provide empirical evidence on the effects of industry competition, corporate cash holding (CCH), and digital innovation (DI) on anti-corruption disclosure (ACD) and the role of independent commissioners as the moderating variable. The sample comprises 340 non-financial and non-service companies listed on the Indonesia Stock Exchange in 2023, which are analyzed using panel regression. The results show that industry competition, CCH, and DI positively influence ACD. Furthermore, this research identifies independent commissioners as a homologized moderator. Most robust tests show that the control variable, industry type, also exhibits a positive effect on ACD. In conclusion, the government should add items to be disclosed by companies in annual reports related to anti-corruption to discourage unethical practices and oppose corruption. The study's practical implication is that by increasing transparency about corruption, companies communicate a strong message of opposition to corruption and unethical practices.

Contribution/ Originality: The novelty of this research lies in the modified measurement of the ACD variable. The results showed that Indonesian companies are prepared and willing to disclose efforts to avoid corruption, which exceed the requirements of Indonesian regulation (SEOJK No. 16 of 2021) and offer a reference for future research.

1. INTRODUCTION

The prevalence of corruption in Indonesia is extremely unfavorable in the CPI (Corruption Perceptions Index), with the score consistently remaining below 50 from 2012 to 2023 (Transparency International, 2024). Similarly, the Political and Economic Risk Consultancy (PERC) Limited, during the Annual Review of Corruption in Asia (Political and Economic Risk Consultancy (PERC) Limited, 2022), reported that Indonesia had a perceived corruption score of 7.97, the lowest among the surveyed countries.

Based on data acquired from 2015 to 2023 by the Corruption Eradication Commission (KPK), private-sector actors constituted the majority of the reported cases, with approximately 417 individuals implicated (Corruption Eradication Commission (KPK), 2024). This sector was identified as the main contributor to corruption in many countries (Barkemeyer, Preuss, & Lee, 2015), engaging in practices such as bribing government officials to secure contracts or fostering internal gains, including nepotism in employee hiring (Argandona, 2002; Sikka & Lehman, 2015).

Several research studies have reported that corruption in the private sector has reduced trust (Gillanders & Neselevska, 2018). According to Hess and Dunfee, it weakened business operations and reputations, reduced profits and returns for investors (Osuji, 2011), and increased operational risks (Chandler & Graham, 2010). The implementation of anti-corruption systems is essential for companies. In order to survive and obtain legitimacy, companies should make substantial efforts in response to coercive pressures by disclosing anti-corruption information (Sari, Cahaya, & Joseph, 2021). This is in line with signaling theory, which shows that anti-corruption disclosure (ACD) serves as a message to external stakeholders who lack access to the internal information available to company management (Harun, Hussainey, Mohd Kharuddin, & Farooque, 2020).

Following the discussion, to compete in an increasingly intense sector, companies face heightened business risks, resulting in the need for stronger stakeholder support (Ren, Zhou, Si, Wang, & Guo, 2024). Mixed results were obtained regarding the relative effects of industry competition on agency conflicts, with some stating it offered certain benefits and others reporting otherwise. Preliminary research reported that higher levels of competition positively influence management by motivating creativity, innovation, and efficiency. Management is strongly motivated to ensure survival, reducing opportunistic behavior. Meanwhile, the pressure to win the competition leads to opportunistic behavior and a lack of transparency, potentially resulting in illegal activities, including bribery and corruption (Bimo, Silalahi, & Kusumadewi, 2022). These diverse results, particularly when connected to illegal actions such as corruption, present an intriguing research gap regarding the influence of industry competition on ACD.

Jayakody, Morelli, and Oberoi (2023) and Tran (2020) reported that companies operating in countries with higher corruption scores responded to increasing political uncertainty by holding more cash compared to those in nations with lower corruption levels. The results also showed that corruption had a positive relationship with cash ownership. The aim of corporate cash holding (CCH) was bribery, as companies balanced agency and bribery motives in managing corporate liquidity. This behavior demonstrated that companies in more corrupt environments acquired excessive funds to influence officials and reduce political risks. Regarding the connection between CCH and ACD, Masud, Rahman, and Rashid (2022) stated that CCH had a significant and negative association with ACD. Considering the high levels of corruption in Indonesia, research on CCH and its relationship with ACD is particularly relevant in this context.

The deployment of information and communication technologies (ICT) in combating corruption has become increasingly popular. The willingness to adopt modern methods, driven by the rapid development of ICT, has led to innovative new solutions (Nurkey, Mukasheva, & Yedilkhan, 2022). Furthermore, digitalization facilitated by ICT has undergone significant transformations over the past decades (Pineda, Jabba, & Nieto-Bernal, 2024; World Economic Forum, 2020). The digitalization of society has produced an economic environment where innovation, connectivity, and information play a fundamental role (Pineda et al., 2024). Information technology has also been proven to reduce corruption (Campra, Esposito, & Brescia, 2023; Shim & Eom, 2009), while digitalization serves as a powerful tool for enhancing accountability (Santiso, 2022; Moser-Plautz & Schmidthuber, 2023). Thommandru, Maratovich, and Saparovna (2024); Nurkey et al. (2022); Faisal, Joseph, Saputri, and Prastiwi (2022) and Shim and Eom (2009) reported that technology helped reduce or combat corruption, including supporting anti-corruption activities.

The research gap arose from differing results regarding the relationship between independent variables and ACD, resulting in the need for further investigation. The difference between the current and previous research is the inclusion of the moderating variable, independent commissioner, hypothesized to either strengthen or weaken the effects of industry competition, CCH, and digital innovation (DI) on ACD. Ghazwani, Alamir, Salem, and Sawan (2024) stated that companies enhanced compliance by adopting anti-corruption obligations and effective corporate governance practices. In addition, decision-makers tend to engage in actions that alter the interests of others in the absence of effective oversight procedures (Fama & Jensen, 1983).

Inadequate supervision and monitoring may cause companies not to adhere to corporate governance frameworks and ACD requirements, thereby hindering the effective tackling of corruption (Ghazwani et al., 2024). Another difference related to ACD, specifically in Indonesia, was the use of variables such as corporate governance mechanisms or characteristics. Typical examples included managerial, blockholder, and government ownership, independence and size of the board of commissioners, independence and competence of the audit committee, as well as institutional ownership and gender diversity on the board and firm size (Hartomo & Hutomo, 2020; Indarto, 2023; Permatasari & Prastiwi, 2023; Rusli & Fernandez, 2022). According to this research, the exclusion of these variables in previous analyses was perceived as a weakness, considering that other factors also affected ACD. This research examined the influence of other factors on ACD, as reported in previous paragraphs, criticizing previous reviews that reported only corporate governance affected ACD. The fact remained that good governance was inadequate for companies to disclose anti-corruption activities conducted.

The purpose of this research was to analyze the effects of industry competition, CCH, and DI on ACD, with independent commissioners serving as a moderating variable. Therefore, the novelty included expanding the measurement of ACD. The current ACD in reports published by companies in Indonesia referred to the Financial Services Authority Circular Letter (SEOJK) No. 16 of 2021, which stipulated only one dimension and two indicators. This research developed three dimensions and 19 indicators, totaling four dimensions and 21 indicators, resulting in a comprehensive measurement of ACD. Additionally, firm age and size, including industry type, served as control variables.

2. LITERATURE REVIEW

2.1. Anti-Corruption Disclosure (ACD)

Davis (2012) stated that corruption is conventionally defined as the abuse of public power for personal gain. These violations tend to take several forms, with the most common being bribery, which is the abuse of public office in exchange for benefits from other parties. In general, corruption occurs at the intersection of the public and private sectors, specifically where officials are directly responsible for the provision of services, including the application of special regulations or levies (Langseth, Stapenhurst, & Pope, 1997).

Hess and Dunfee (2000) stated that corruption affects business reputation, reduces profits and returns to investors (Osuji, 2011), and increases risks in company operations (Chandler & Graham, 2010). Masud, Hossain, Rahman, Chowdhury, and Rahman (2024) stated that it is a significant problem in developing countries and is also considered cancerous in society. Therefore, companies need to implement and disclose an anti-corruption system. ACD is a form of reporting carried out voluntarily or based on regulations related to the policies, procedures, and practices adopted by the company regarding the prevention and detection of corruption (Ghazwani et al., 2024). It also plays an important role in the fight against corruption (Ghazwani et al., 2024), with the disclosure depicting the transparency of the company. Furthermore, , Halter, De Arruda, and Halter (2009) defined transparency as a tool used to reduce corruption. This is in line with the research by Barkemeyer et al. (2015), which stated that companies associated with acts of corruption fail to publicly show commitment to anti-corruption actions.

The adoption of signaling theory implies that ACD signals provided by management, alongside effective governance structures, have the potential to reduce information asymmetry and conflicts of interest, including the improvement of overall performance. The implementation process is relevant in situations characterized by information asymmetry, where external parties do not have access to internal reports concerning the company (Ghazwani et al., 2024). The disclosure serves as a message to external stakeholders who lack access to information available only to management (Harun et al., 2020).

Cardoni, Kiseleva, and Lombardi (2020) reported that ACD contributed to the sustainability of the good governance model, which was perceived as a way for organizations to improve legitimacy or to prevent and reduce the risk of corruption. According to Duho, Agyenim-Boateng, Asare, and Onumah (2023), the increased ACD reduced the threat associated with business legitimacy in society. The disclosure also enabled the development of a cordial relationship between the business and public legitimacy processes. Increased disclosure enabled companies to convey a strong message to the public regarding their stance against corruption and unethical practices (Masud et al., 2024). According to Sari et al. (2021), for companies to survive and gain legitimacy, they must respond to coercive pressure by disclosing anti-corruption information.

The results of Xie and Zhang (2020) proved that anti-corruption benefited companies because it motivated a corruption-free government. The research also stated that increased corruption eradication served as an alternative to institutional protection, correcting misconduct committed by government officials. Therefore, ACD was considered an effective and efficient market policy mechanism adopted by companies to control corruption, including increasing transparency and accountability (Masud et al., 2024).

Karim, Zubair, and Khan (2016) stated that investors responded to anti-corruption issues disclosed by companies, thereby supporting this practice. According to Issa and Alleyne (2018), the implementation of an anti-corruption system improved the company's image and reputation. It was also reported that a significant increase was observed in anti-corruption reporting, showing a reduction in corruption-related activities. The disclosure process helped achieve both internal and external organizational objectives. Wei and He (2022) stated that anti-corruption reduced the non-productive behaviors of enterprises alongside the motivation for productive investment.

2.2. Hypothesis Development

2.2.1. The Influence of Industry Competition on ACD

The results of Álvarez Etxeberria and Aldaz Odriozola (2018) showed that a direct relationship existed between ACD and corporate reputation. Increased public concerns regarding this issue have forced companies to disclose their anti-corruption efforts (Blanc, Islam, Patten, & Branco, 2017). In addition, a meta-analysis conducted by Chen and Ganapati (2023) proved that transparency mechanisms, such as ACD, had a significant impact on corruption reduction, reinforcing the idea that transparency served as a strategic tool for improved market position.

In this context, the dynamics of industry competition led to scenarios that compelled companies to disclose their respective anti-corruption practices as compliance measures and strategic initiatives, differentiating them from competitors. The process was particularly evident in sectors characterized by high corruption risks, such as the extractive industry, where the stakes were significantly greater due to the potential for substantial financial losses and reputational damage (Duho et al., 2023). Bimo et al. (2022) stated that there were mixed results regarding the relative effects of industry competition on agency conflicts. Certain research reported that competition yielded some benefits, while others stated otherwise. The level of competition had a positive impact, motivating management to be more creative, innovative, and efficient. A high level of competition strongly motivated management to survive, leading to the avoidance of opportunistic behavior. This could also cause several negative impacts, namely decreased performance, unstable profit streams, difficulties in forecasting business prospects, and allocation of resources. Additionally, the pressure to win the competition forces management to act opportunistically and non-transparently, including taking illegal actions, such as bribes, as well as engaging in corruption.

Companies that effectively communicate anti-corruption efforts enhance their respective reputations and attract investors and customers who prioritize ethical business practices (Blanc et al., 2017; Islam, Haque, Dissanayake, Leung, & Handley, 2015) in line with signaling theory. This form of transparency helps eliminate agency conflict, reducing opportunistic behavior among management (Bimo et al., 2022), thereby leading to the proposed hypothesis:

H_1: Industry competition has a positive influence on ACD.

2.2.2. The Influence of CCH on ACD

The intention behind cash holding was connected to bribery, as companies strived to balance both agency and bribery motives in managing corporate liquidity. Highly corrupt environments prompted a willingness to engage in this corrupt practice. Corporate managers also had greater flexibility in generating cash flows for bribery, exploiting the opportunity while disregarding shareholder interests by retaining excessive cash flow. Greater cash balances cause agency problems because the board of directors may not benefit from the maximized wealth of shareholders (Gill & Shah, 2012). Tran (2020) stated that corruption had a positive association with cash holding and flow sensitivity. This was because the reason behind cash holding was bribery. In addition, companies balanced agency and bribery motives in managing corporate liquidity. A highly corrupt environment prompted a willingness to pay bribes.

Jayakody et al. (2023) reported that companies located in countries with higher corruption scores reacted to increased political uncertainty by raising cash holdings compared to those with lower corruption rates. This suggests that companies in more corrupt environments raised funds to facilitate official influence in dealing with political risks. Xie and Zhang (2020) stated that if government intervention was low (anti-corruption intensity was low), then companies held smaller cash reserves compared to when it was high. The research also reported that an increase in the intensity of anti-corruption caused a decrease in cash holdings.

The result by Masud et al. (2022) stated that a negative relationship existed between cash ownership and ACD. It also showed that the cash owed by the company affected the anti-corruption disclosure practices, thereby slightly supporting the proposed hypothesis. The management preferred to keep more money for political donations, bribery, and unethical profits in a highly corrupt economy. Therefore, the following hypothesis was proposed:

H_2: CCH has a negative influence on ACD.

2.2.3. The Influence of DI on ACD

Digitalization was perceived as the most promising instrument used to reduce corruption (Santiso, 2022). Furthermore, innovations provided solutions that enabled digital transformation across various industrial sectors (Lisnawati, Aryati, & Gunawan, 2024). Faisal et al. (2022) reported that public companies should consider adopting new technologies to enhance the variability of ACD in CSR reporting. Based on the technological acceptance model, organizations believe in controlling system resources as digital capabilities, establishing trust to improve performance (Lisnawati et al., 2024).

The digitalization process improved corporate transparency, a signal communicated by companies through respective digital initiatives. Ghazwani et al. (2024) stated that signaling theory served as a foundation for evaluating corporate transparency. The research by Thommandru et al. (2024) focused on how Uzbekistan strengthened its anti-corruption framework by adopting new technologies and enrolling in lessons delivered by Indians due to their experience in using information and communication technology (ICT) to reduce corruption. The results showed several key ways ICT supported anti-corruption efforts adopted by Uzbekistan, such as increasing transparency and accountability through e-governance platforms and digital monitoring systems, respectively, enabling public participation with online reporting tools.

The result of the research by Nurkey et al. (2022) stated that respondents preferred to fight corruption by using ICT as a preventive measure, such as blockchain, big data, and cloud technologies, which provide transparency in business processes. The use of modern information and communication technologies improved the quality of service delivery and accountability through transparency (Moser-Plautz & Schmidthuber, 2023). Cai and Hong (2024) also stated that the adoption of innovative digital technology played a promising role in optimizing company operations. Therefore, this led to the proposed hypothesis regarding DI:

H_3: DI positively influenced ACD.

2.2.4. Independent Commissioner Moderated the Influence of Industry Competition on ACD

In highly competitive industries, the pressure to maintain a positive corporate image is crucial for companies seeking to enhance or sustain market share. This competitive landscape drives the adoption of transparent practices, particularly in ACD. Meanwhile, disclosure serves as a differentiating factor, fostering trust among consumers and stakeholders, which is critical in markets where reputation significantly influences purchasing decisions and investment opportunities (Álvarez Etxeberria & Aldaz Odriozola, 2018; Odriozola, Etxeberria, & Aldaz Odriozola, 2015).

The results on the relative effects of industry competition on agency conflicts varied, as it influenced managerial behavior. The pressure to outperform competitors may force management toward opportunistic and non-transparent actions, including illegal activities, namely bribery and corruption (Bimo et al., 2022). Donadelli, Fasan, and Magnanelli (2014) stated that companies operating in environments sensitive to corruption paid higher agency costs. Meanwhile, agency theory focuses on ideas related to opportunism and information asymmetry, including potential conflicts of interest between managers and shareholders. This led to the monitoring or controlling of managers' behavior, ensuring efforts were focused on maximizing wealth rather than personal interests at the expense of shareholders (Gerged, 2021). The presence of an independent commissioner was expected to reduce these negative effects of industry competition.

Donadelli et al. (2014) reported that a higher percentage of independent board members was related to the performance of companies operating in an environment sensitive to corruption. Similarly, Jaggi, Allini, Ginesti, and Macchioni (2021) stated that those with greater board independence exhibited more comprehensive corruption disclosures. According to Hartomo and Hutomo (2020), independent commissioners positively influenced ACD. The research also stated that the increasing number of independent boards of commissioners resulted in quality oversight, as proven by the rising anti-corruption openness. Based on these results, the following hypothesis was proposed.

H_4: The independent commissioner strengthened the positive influence of industry competition on ACD.

2.2.5. Independent Commissioner Moderated the Influence of CCH on ACD

Companies operating in highly corrupt circumstances tend to accumulate more funds, exhibiting greater cash flow sensitivity. The agency motive, also referred to as related problems, may arise due to the presence of cash holdings (Tran, 2020). Based on information asymmetry and agency problems, high cash reserves are associated with higher agency costs. Managers may create cash reserves to gain flexibility in pursuing personal objectives. Cash is also spent freely on chosen projects, although it may not contribute to maximizing shareholder wealth (Cai, Hu, Xu, & Zheng, 2022). Donadelli et al. (2014) stated that companies in environments sensitive to corruption tend to incur higher agency costs.

Following the discussion, decision-makers acted against the interests of other stakeholders if effective monitoring procedures were nonexistent (Fama & Jensen, 1983). Independent boards served as external monitors for both corporate leaders and non-independent members, helping to eliminate or at least reduce corrupt activities. Companies may not comply with corporate governance and ACD frameworks, thereby hindering the effectiveness of tackling corruption without strong oversight and monitoring (Ghazwani et al., 2024). Boards with a higher percentage of independent members have a strong and positive influence on company performance (Donadelli et al., 2014). Rusli and Fernandez (2022) stated that independent commissioners positively influenced ACD. The variable also drove anti-corruption disclosure practices. Therefore, this led to the following hypothesis.

H_5: The independent commissioner weakened the negative effect of CCH on ACD.

2.2.6. Independent Commissioner Moderated the Influence of DI on ACD

Previous research stated that digitalization was the most promising instrument to tackle corruption (Santiso, 2022). According to Thommandru et al. (2024) and Nurkey et al. (2022), technology can reduce corruption, including

supporting anti-corruption efforts. Cardoni et al. (2020) conducted research focused on the importance of intelligent and digital anti-corruption controls, using new technologies to influence ongoing monitoring rather than ex-ante approvals. In addition, this outlined the critical role of innovations in digital technology. Nurkey et al. (2022) also reported that respondents held positive attitudes toward the use of ICT in addressing or preventing corruption. This was realized through big data, cloud technologies, and blockchain, which could enhance transparency in business processes.

In this context, signaling theory states that ACD signals issued by management, combined with an effective governance structure, reduce the agency problem (Ghazwani et al., 2024). Digitalization efforts serve as a management strategy to mark the transparent activities of a company, ensuring they are in line with the best interests of stakeholders. Prior research reported that independent boards acted as external monitors for corporate leaders (Donadelli et al., 2014). Ghazwani et al. (2024) stated that increasing ACD and governance reduced corruption, prompting efforts towards ethical behavior. However, without strong oversight and monitoring, companies may not comply with corporate governance and ACD frameworks, hindering the effectiveness of addressing corruption. Tirtasari and Hartomo (2019) reported that independent commissioners had positively influenced ACD. The research also stated that the independence of the board of commissioners led to effective supervision, prompting ACD policies to maintain company survival and form of accountability to stakeholders. Based on these results, the following hypothesis was proposed.

H_a: The independent commissioner strengthened the positive influence of DI on ACD.

3. RESEARCH METHODS

The research population consisted of non-financial and non-service sector companies listed on the Indonesia Stock Exchange (IDX) in 2023. Furthermore, 2023 was selected because it was the last period at the time the research was conducted (to target the latest data), and based on data from Indonesia KPK, the second highest number of cases handled were recorded from 2004 to 2023 (Corruption Eradication Commission (KPK), 2024). Financial sectors (banks, financing, insurance, and investment services) and service companies were excluded due to differences in products. This industry was categorized as a highly regulated sector with distinct management. Purposive sampling was used to obtain the research population, which comprised 340 non-financial and non-service companies listed on IDX in 2023.

This research used anti-corruption disclosure as the independent variable. Industry competition, CCH, and DI were used as the dependent variables, with independent commissioners serving as moderators. The control variables included firm size (Dang, Li, & Yang, 2018; Gerged, 2021; Ghazwani et al., 2024) and age (Ghazwani et al., 2024; Masud et al., 2024; Muttakin, Mihret, & Khan, 2018), as well as industry type (Ghazwani et al., 2024; Odriozola et al., 2015). The variables were outlined in greater detail in the subsequent paragraphs.

1. ACD refers to a report published by the company based on regulations or voluntarily related to the policies, procedures, and practices carried out in line with the prevention and detection of corruption (Ghazwani et al., 2024). The measurement of ACD led to the adoption of a modified framework comprising disclosures regulated by SEOJK No. 16 of 2021 (1 dimension and two indicators). These included additional dimensions, namely top-level commitment (Salem, Ghazwani, Gerged, & Whittington, 2023), prevention and effective reporting (Association of Certified Fraud Examiners (ACFE), 2022), and accounting for combating bribery (Joseph et al., 2016), modified into 6, 6, and 7 indicators, respectively. Consequently, the measurement of ACD in this context consisted of 4 dimensions and 21 indicators.

Brown, Treviño, and Harrison (2005) stated that leaders should serve as the main sources of ethical guidance for their subordinates. Moreover, if a leader engages in unethical behavior or violates the law through corruption, this sets a precedent for subordinates to follow such unlawful practices. The research by Siahaan, Suharman, Fitrijanti, and Umar (2024) stated that management commitment influences the detection of corruption. Any management that

does not tolerate bribery and corruption demonstrates a form of commitment to ethical values, constructively reducing the risk of corruption.

In this context, the importance of reporting mechanisms functions as a preventive measure against fraud or corruption, such as whistleblowing systems (WBS). Detection is also a critical step in fraud investigations, as the speed and method of execution significantly influence the magnitude of the corrupt practice. Moreover, it plays a crucial role in the prevention of fraud, as staff tend to perceive that potential fraud should be detected, deterring its occurrence (Association of Certified Fraud Examiners (ACFE), 2022). Zakaria (2015) and Razak, Noor, and Zakaria (2015) reported that whistleblowing is an essential element serving as a mechanism to prevent illegal, immoral, and illegitimate practices in organizations. According to Barboza and Da Rocha (2024), this system is the main mechanism for addressing organizational misconduct. Hamilah, Adji Suratman, and Saeful Alam (2022) further stated that the whistleblowing system is an application designed to report violations.

An additional dimension proposed by Joseph et al. (2016) was accounting for combating bribery. The measurement indicators addressed prohibitions, regulations, and internal control systems designed by companies to reduce corruption. The Association of Certified Fraud Examiners (ACFE) (2022) survey showed that although anti-fraud controls were adopted, fraud persisted due to inadequate internal controls. Siahaan, Umar, and Purba (2019) reported that the insufficiency failed to deter perpetrators from justifying illegal actions. In addition, internal control played a significant role in reducing or eliminating corruption (Baltaci & Yilmaz, 2006).

2. DI was conceptualized as an innovative IT solution that integrated evolving digital technologies to support the digitalization of non-technology businesses (Khin & Ho, 2019). DI was measured with the metrics developed by Lisnawati et al. (2024) and Khin and Ho (2019), which comprised four dimensions (digital products, services, and solutions; digital supply chain; accounting; and culture) and 19 indicators.

The measurement of ACD and DI variables adopted content analysis with scores ranging from 0 to 3 (Papoutsi & Sodhi, 2020). The procedure was modified to include quantitative information, starting with a score of 2. Furthermore, the measurement assigned scores of 0, 1, 2, and 3 for an item not referred to in the report, when briefly mentioned, provided a sentence pertinent to the item and the provision of more than one sentence in line with the quantitative data, respectively. This modification was essential as most measurements in the context relied on narrative information. ACD and DI were measured with the following index:

$$\text{Variable measurement} = \frac{\text{Total items disclosed in each element}}{\text{The total number of items in each element}}$$

3. Industry competition (IC) is defined as the competitiveness of companies in the same sector, for example, those producing similar class products (Bimo et al., 2022). The measurement of IC is the sales of a company divided by the total sales of all companies in the same industry (Bimo et al., 2022).

$$IC = \text{Sales of Company}/\text{Total Sales of Industry}$$

4. CCH is referred to as cash at hand or ready to be used by the company. CCH consists of cash on hand or liquid assets that are readily available to the company (Gill & Shah, 2012). Moreover, CCH is measured by the formula log of Cash and Cash Equivalents (Jayakody et al., 2023).

$$CCH = \textit{log Cash and Cash Equivalent}$$

5. An Independent Commissioner (INC) is a member of the board of commissioners, not affiliated with major shareholders, the board of directors, or other members (UU RI Nomor 40 Tahun 2007, 2007). In Indonesia, the commissioners represent independent parties. IDX has eliminated the obligation for issuers to campaign for independent director positions on the board of directors (CNBC Indonesia, 2018). Therefore, INC is measured using the formula: the number of independent commissioners divided by the total number of boards of commissioners and directors (Bouhamdan, Mostapha, & Hegazy, 2023; Ghazwani et al., 2024; Previtali & Cerchiello, 2023).

$$INC = \frac{\text{Total Number of Independent Commissioner}}{\text{Total Number of Board commissioners + Total Number of board Directors}}$$

6. Dang et al. (2018) stated that the fundamental characteristic of a company, particularly its size, is generally considered important. In addition, firm size (FS) is calculated using the natural logarithm of total assets (Murwaningsari & Rachmawati, 2023). The natural logarithm is used to determine the scale of an asset whose value tends to be represented in full monetary units. This ensures that the range of values with other variables is not high.

$$FS = \text{Log of Total Assets}$$

7. Long-established companies are more transparent about corruption due to their high reputation, market visibility, and commitment to stakeholders (Masud et al., 2024). Meanwhile, firm age (FA) is measured by the number of years since establishment (Widiyati & Murwaningsari, 2021).

$$FA = \text{Number of years since the company was established}$$

8. The type of industry affects the response to corruption because the risks faced may differ. Additionally, this produces a variety of responses to address the problem (Duho et al., 2023). Industry type and government ownership possess a unique relationship. Government shareholding causes the company to operate in harmony, meeting the stipulated interests. Furthermore, the company must comply with procedures and rules concerning precautionary measures. Industry type (IT) was measured by a dummy variable, with the company marked as one categorized as a government or state-owned enterprise and zero as private (Hartomo & Hutomo, 2020).

Following the discussion, both descriptive and regression analyses were used to evaluate the acquired data. A descriptive analysis was used to describe the characteristics of the research samples, and hypothesis testing was conducted using panel regression. H1 to H6 were tested by examining the direct effect of the independent and moderating variables on modified ACD. The moderated regression analysis (MRA) method was also adopted for this purpose. MRA maintained sample integrity, providing a basis for controlling the effect of the moderating variable (Ghozali, 2011). This was realized using the following equations:

$$ACD_{it} = \beta_0 + \beta_1 IC_{it} + \beta_2 CCH_{it} + \beta_3 DI_{it} + \beta_4 FS_{it} + \beta_5 FA_{it} + \beta_6 IT_{it} + \varepsilon_{it} \quad \text{(Model 1)}$$

$$ACD_{it} = \beta_0 + \beta_1 IC_{it} + \beta_2 CCH_{it} + \beta_3 DI_{it} + \beta_4 IC_{it} * INC_{it} + \beta_5 CCH_{it} * INC_{it} + \beta_6 DI_{it} * INC_{it} + \beta_7 FS_{it} + \beta_8 FA_{it} + \beta_9 IT_{it} + \varepsilon_{it} \quad \text{(Model 2)}$$

Where ACD = Anti-Corruption Disclosure, IC = Industry Competition, CCH = Corporate Cash Holding, DI = Digital Innovation, INC = Independent Commissioner, IT = Industry Type, FA = Firm Age, FS = Firm Size.

All analyses were processed using the Statistical Package for the Social Sciences (SPSS) program. Preliminary research reported that SPSS was prominent for its ability to handle complex analyses, generate predictions, and produce various visualizations such as charts and graphs (Rahman & Muktadir, 2021).

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

Descriptive statistics were used to provide an overview of the research variables, which consisted of the mean, standard deviation, minimum, and maximum values. The original data were logarithmically transformed, with descriptive statistics shown in Table 1.

Table 1. Descriptive statistics.

Variables	Sample	Minimum	Maximum	Mean	Std. dev.
ACD	340	0.190	0.968	0. 606	0. 150
IC	340	0.000	0.876	0. 018	0. 066
CCH	340	17.367	35.461	27.101	3.583
DI	340	0.211	0.825	0. 560	0. 121
INC	340	0.083	0.667	0. 234	0. 081
FS	340	19.251	37.285	28. 950	3. 103
FA	340	2	112	34. 502	17.968
IT	340	0	1	0. 014	0. 120
Valid N (Listwise)	340	-	-	-	-

Note: ACD = Anti-corruption disclosure, IC = Industry competition, CCH = Corporate cash holding, DI = Digital innovation, INC = Independent commissioner, FA = Firm age, IT = Industry type, FS = Firm size.

The mean value for ACD is 0.606, and since the highest potential score from the content analysis was 3, the mean value of 0.606, or 60.6%, corresponded to the implementation level of 1.818 (60.6% × 3). This shows that the mean level of ACD is 1.818, equivalent to 60.6%, which is considered moderately good. However, the standard deviation of 0.149 indicates low variability in the data distribution of the mean.

Industry Competition (IC) had a mean value and standard deviation of 0.018 and 0.066, respectively. The data distribution for this variable was uneven, as certain sectors comprised large or holding companies, resulting in significantly greater values. The variable CCH also showed substantial differences in distribution. Large or holding companies possessed significantly higher cash and equivalents. The Basic Materials sector ranked highest in cash and equivalents, followed by Property and Real Estate, Technology, Consumer Cyclicals, Healthcare, Industrial, and Energy. Similarly, large or holding companies influenced the control variable Firm Size (FS), measured by total assets.

DI had mean and standard deviation values of 0.560 and 0.121, respectively. This showed that the data was not widely dispersed from the mean, indicating consistent results. Generally, all companies have engaged in technology usage, with an average disclosure rate equivalent to 50% of the total possible disclosure. The mean and median scores for Independent Commissioner were 0.234 and 0.081, respectively. Furthermore, the companies associated with this variable had a low ratio, with the majority adhering to the regulatory standards for an independent board.

FA had a mean score and standard deviation of 34.503 and 17.969, respectively, showing significant variation among companies, with the youngest being found in the technology sector. In line with the discussion, Industry Type was measured using a dummy variable, where companies were coded as one if categorized as government or state-owned and zero if otherwise. The mean value of 0.01 proved that the majority of companies were non-government entities.

4.2. Analysis and Empirical Results

The data quality tests showed that the acquired information was distributed normally without multicollinearity, heteroscedasticity, or autocorrelation issues. The Adjusted R^2 values included 8.7% (Model 1) and 9.2% (Model 2), representing the extent to which the variables IC, CCH, DI, and INC, alongside the control variables FS, FA, and IT, explained the variation in ACD. Specifically, 8.7% and 9.2% of the variation in ACD were explained by these models, with the remaining 91.3% (Model 1) and 90.8% (Model 2) influenced by external variables.

The results of the F-test showed a significant level of 0.000, which is less than 0.05, confirming that the model used was statistically valid. Therefore, the regression model was used to predict ACD. Table 2 shows the results of the hypothesis testing for the influence of Industry Competition, CCH, and DI on ACD, with Independent Commissioner serving as the moderating variable and Industry Type, FA, and FS as controls.

Table 2. Hypothesis testing results.

Variable	Direction	Model 1			Model 2		
		Stand. coeff. Beta	T	Sig.	Stand. coeff. Beta	T	Sig.
(Constant)			3.718	0.000		0.786	0.216
IC	+	0.109	2.001	0.023**	0.102	0.575	0.283
CCH	-	0.092	1.402	0.081*	0.235	1.376	0.085*
DI	+	0.149	2.771	0.003***	0.034	0.203	0.420
INC					0.152	0.727	0.234
IC_INC	+				0.008	0.045	0.482
CCH_INC	+				-0.431	-0.968	0.167
DI_INC	+				0.238	0.761	0.224
FS		0.060	0.939	0.174	0.071	1.094	0.138
FA		0.009	0.163	0.436	0.014	0.261	0.397
IT		0.125	2.323	0.011**	0.112	2.009	0.023**
Adjusted R2				8.7%			9.2%

Note: Dependent variable: Anti-corruption disclosure (ACD).
*Significance at 10%, **Significance at 5%, ***Significance at 1%.
ACD = Anti-corruption disclosure, IC = Industry competition, CCH = Corporate cash holding, DI = Digital innovations, INC = Independent commissioner, FA = Firm Age, FS = Firm size, IT = Industry type.

The results of industry competition in Table 2 showed a significant value of 0.023. Since the coefficient and significance were positive and < 0.05, industry competition was proven to significantly have a positive effect on ACD. CCH had a significant value of 0.081; because it is < 0.1, the variable positively influenced ACD. Therefore, CCH was proven to have a significant positive effect on ACD. The result for DI showed a significant value of 0.003, and due to the coefficient being positive and the significance level < 0.01, the variable was proven to have a significant and positive influence on ACD. The result to test whether the independent commissioner moderates the influence of industry competition on ACD showed a significant value of 0.482. Independent commissioners do not moderate the influence of industry competition on ACD or strengthen the positive effect because the significance level is > 0.10. The result tested whether an independent commissioner moderates the influence of CCH on ACD and showed a significant value of 0.167. Due to the significance level being > 0.10, the independent commissioner does not moderate the influence of CCH on ACD or weaken the negative effect. Finally, the result to test whether an independent commissioner moderates the influence of DI on ACD showed a significant value of 0.226. However, because the significance level is > 0.10, the independent commissioner does not moderate the influence of DI on ACD or strengthen the positive effect.

Based on the results of the moderation test, the direct influence of the moderating variable, independent commissioner, on ACD, as shown in Table 2, proved to have an insignificant effect on ACD. IC failed to moderate the effects of the independent variables—industry competition, CCH, and DI—on the dependent variable, ACD, as shown in Table 2. In this case, the moderating variable was identified as a potential homologized moderator. This variable acted as a moderator due to its influence on the strength of the connections between the independent and dependent variables. However, it does not interact with the independent variables, having an insignificant connection with the dependent variable (Ghozali, 2011; Rachmawati, 2023).

In line with the analysis of the control variables used, it was reported that industry type significantly influenced ACD because the result had a value of less than 0.05. However, FS and FA do not have any significant effect on ACD.

4.3. Discussion

Industry competition had a significant and positive effect on ACD. Therefore, H1 was accepted. The dynamics of this variable led to scenarios compelling companies to disclose anti-corruption practices. The initiative was perceived as an obedience measure and a strategic initiative to differentiate competitors. This was particularly evident in sectors with high corruption risks, such as extractive industries, where the stakes were significantly greater due to the potential for substantial financial losses and reputational damage (Duho et al., 2023).

Companies that effectively communicated their adopted anti-corruption efforts improved their respective reputations, also attracting investors and customers who prioritized ethical business practices (Blanc et al., 2017; Islam et al., 2015). This was in line with signaling theory, where transparency helped eliminate agency conflicts and opportunistic tendencies in management (Bimo et al., 2022). The results showed that in highly competitive industries, companies would increase their anti-corruption disclosures (ACD). The pressure to win the competition forced management to act ethically and transparently. The high level of the corruption index in Indonesia enabled companies to enhance their respective reputations, thereby outpacing competitors due to transparency. This was in line with the research by Blanc et al. (2017), which indicated that with the increasing public concern about corruption, companies used disclosure to represent their anti-corruption efforts. The results supported prior research by Etxeberria and Odriozola (2018), which reported the existence of a direct relationship between ACD and corporate reputation.

CCH influenced ACD, but the direction of the influence was positive and was proven to have a significant and positive effect on ACD. Therefore, H2 was rejected. Cash is a critical aspect of corporate operations and investment strategies, with the allocation directly affecting performance (Cai et al., 2022). Prior research stated that cash reserves played a crucial role in the provision of liquidity, enabling corporations to meet their respective obligations on time, even during adverse conditions.

The result showed that the greater the cash ownership by companies, the higher the ACD. The analysis indicated that cash was an essential element that enabled businesses to survive and thrive. This was in line with Gill and Shah (2012), who stated that to increase sales and profitability, companies needed to prepare cash reserves by ensuring that cash flow timing made an overall positive impact. In this context, the ownership of cash and equivalents by the company reflected a corporate intent to grow, positively impacting ACD. Cash and equivalents represented funds genuinely required by companies for diverse operations and investments. However, in cases where the funds were used for bribery, they were recorded as consulting fees (BBC News, 2020) or other business expenses (Detik.com, 2020).

DI was proven to have a significant and positive effect on ACD. Therefore, H3 was accepted. Innovation served as a solution enabling digital transformation across various industrial sectors. Moser-Plautz and Schmidthuber (2023) stated that the use of modern ICT improved service delivery quality, enhancing accountability through transparent information. Corruption is the main variable in corporate social responsibility (CSR) initiatives, aimed at ensuring long-term societal well-being, which is reduced by information technology (Campra et al., 2023; Shim & Eom, 2009). According to previous research, it is also known as one of the instruments for combating corruption (Santiso, 2022).

The results showed that companies developing adopted technology would increasingly disclose their respective anti-corruption efforts. This was due to the awareness that technology reduced corruption and increased accountability. Based on the technological acceptance model, organizations confidently adopted the system resources as digital capabilities, and trust enhanced performance (Lisnawati et al., 2024). These results supported prior research by Thommandru et al. (2024) and Nurkey et al. (2022) that ICT was used to combat and prevent corruption while supporting anti-corruption efforts.

H4 aimed to test whether independent commissioners strengthened the positive influence of industry competition on ACD. This showed that independent commissioners did not strengthen the positive effect of industry competition on ACD. Therefore, H4 was rejected. H5 aimed to test whether independent commissioners weakened the negative effect of CCH on ACD. The result proved that the variable did not weaken the negative effect of CCH on ACD. H6 focused on testing whether independent commissioners strengthened the positive influence of DI on ACD. In addition, the variable did not strengthen the positive effect of DI on ACD.

The findings showed that the independent commissioner was unable to moderate the influence of industry competition, CCH, and DI on ACD. Meanwhile, independent commissioner supervision does not play a role in management decisions or actions related to industry competition, cash holding, and technology innovation. This was

in line with previous research, which reported the inability of independent commissioners to function effectively as supervisors (Paramitha & Rahardjo, 2013; Rahayu, 2023; Sembiring & Saragih, 2019).

The reason was due to differences in educational backgrounds and experiences. The lack of regulation regarding required and mandatory educational qualifications for the position of independent commissioner could introduce a form of bias (Rahayu, 2023). The formation of independent boards of commissioners was conducted to comply with mandated regulations or fulfill legal requirements (Rahayu, 2023; Sembiring & Saragih, 2019). As a result, not all independent commissioners executed assigned duties as expected (Octosiva, Hadiwidjojo, & Prakoso, 2016). Sembiring and Saragih (2019) also stated that the designation of the variable was commonly based not on professional competence but on proximity to the company as a member of the honorary position. This weakened the independence of the commissioner in performing certain duties, such as corporate operations and strategies.

The results of Paramitha and Rahardjo (2013) showed that the presence of independent members in the audit committee or board of commissioners did not guarantee the implementation of good corporate governance. This was because the largest shareholders protected their respective interests by nominating independent candidates through voting rights in the Shareholders' General Meeting. As a result, the independence of these board members was compromised, affecting performance.

Based on the earlier explanation, while the independent commissioner provided oversight, the role appeared to be less than optimal, as evidenced by the persistent emergence of corruption cases concerning private entities. Another interpretation of why independent commissioners failed to moderate the influence of industry competition, CCH, and DI on ACD was the generally low ratio compared to the total number of members, including the board of commissioners and directors. This limited ratio reduced the ability to strengthen the impact of the three variables on ACD. The results of Donadelli et al. (2014) stated that a greater percentage of independent board members was associated with better performance, particularly for firms operating in industries sensitive to corruption.

Further explanation for the results of H4, H5, and H6 showed that the independent commissioner functioned as a homologized moderator, meaning it was only a potential moderating variable. This type of variable did not interact with the independent and dependent variables (Ghozali, 2011; Rachmawati, 2023).

4.4. Sensitivity Test

The novelty of this research focused on the modified measurement of the ACD variable. The sensitivity test conducted aimed to determine the level of robustness by comparing the ACD measurement developed by the research with the measurement model outlined in SEOJK No. 16 of 2021. The two equations used in this test were identical to the primary testing, namely (1) testing the direct effect of the independent variables (industry competition, CCH, and DI) on ACD and (2) testing moderated regression, which examined the effect of the independent variables on ACD with the commissioner acting as a moderating variable. A comparison of the results from the new measurement (primary test) and sensitivity test is shown in Table 3. Table 3 showed that CCH significantly affected ACD, as represented by a significant value of < 0.05, albeit with a positive coefficient. Industry competition and DI did not significantly affect ACD, as the significance values exceeded 0.10. In the primary test, industry competition, DI, and CCH were found to influence ACD. However, this sensitivity test proved that only CCH directly affected the dependent variable. The moderating variable (independent commissioner) did not moderate the effects of industry competition, CCH, or DI on ACD, as represented by significance values greater than 0.10. The findings were in line with the second equation in the primary test, where the moderating variable failed to moderate the connections between the independent and dependent variables.

Table 3. Comparison of old and new ACD measurements.

Description		New measurement						Old measurement					
		Model 1			Model 2			Model 1			Model 2		
Variable	Direction	Stand. coeff. Beta	T	Sig.	Stand. coeff. Beta	T	Sig.	Stand. coeff. Beta	T	Sig.	Stand. coeff. Beta	T	Sig.
(Constant)			3.718	0.000		0.786	0.216		2.638	0.009		0.756	0.225
IC	+	0.109	2.001	0.023**	0.102	0.575	0.283	0.068	1.204	0.115	0.003	0.017	0.493
CCH	-	0.092	1.402	0.081*	0.235	1.376	0.085*	0.147	2.166	0.016**	0.150	0.836	0.202
DI	+	0.149	2.771	0.003***	0.034	0.203	0.420	0.039	0.699	0.243	0.121	0.705	0.241
INC					0.152	0.727	0.234				0.144	0.332	0.370
IC_INC	+				0.008	0.045	0.482				0.068	0.342	0.367
CCH_INC	+				-0.431	-0.968	0.167				0.005	0.011	0.496
DI_INC	+				0.238	0.761	0.224				-0.159	-0.503	0.308
FS		0.060	0.939	0.174	0.071	1.094	0.138	0.052	0.780	0.218	0.051	0.741	0.230
FA		0.009	0.163	0.436	0.014	0.261	0.397	-0.010	-0.180	0.429	-0.010	-0.178	0.430
IT		0.125	2.323	0.011**	0.112	2.009	0.023**	0.033	0.606	0.273	0.028	0.486	0.314
Adj. R2				8.7%			9.2%				3.7%		2.7%

Note: Dependent variable: Anti-corruption disclosure (ACD).
*Significance at 10%, **Significance at 5%, ***Significance at 1%.
Notes: ACD = Anti-corruption disclosure, IC = Industry competition, CCH = Corporate cash holding, DI = Digital innovations, INC = Independent commissioner, FA = Firm age, FS = Firm size, IT = Industry type.

The results of the sensitivity test led to the conclusion that the first and second equations of the primary test (Model novelty) were superior compared to the first and second equations of the sensitivity test. This was supported by the p-value of the F-test, or primary test, which was smaller compared to the sensitivity test. Additionally, the Adjusted R^2 values in the primary test were higher compared to the sensitivity test. The values for the first and second equations in the primary test were 8.7% and 9.2%, as shown in Tables 2 and 3, compared to 3.7% and 2.7% obtained from the sensitivity test.

The increase in the Adjusted R^2 values in the primary test model compared to sensitivity indicated that the modified ACD model was better than the unmodified type. This demonstrated the superiority of the modified dependent variable, ACD, in capturing the relationships in the model.

5. CONCLUSION

In conclusion, this research aimed to examine and produce empirical evidence on the factors influencing ACD, namely industry competition, CCH, and DI. Additionally, the moderating effect of independent commissioners on the connection between these variables and ACD was investigated, leading to the development of an updated measurement. The results showed that industry competition, CCH, and DI positively influenced ACD. However, CCH was expected to have a negative effect on ACD. The research recognized the independent commissioner as a homologized moderator, showing a limited role as a moderating variable. Following the discussion, the results showed that Indonesian companies were ready and willing to disclose efforts to combat corruption, often exceeding the requirements stipulated in SEOJK No. 16 of 2021. As a result, the government, as policymakers, was expected to include items that needed to be disclosed by companies in their respective annual reports related to anti-corruption. For example, the additions made by research related to the development of ACD measurement include activities concerning top-level commitments, effective prevention, reporting, and accounting for combating corruption. This research also contributed to the development of ACD measurements, offering a reference point for comparative research on similar topics.

Based on a theoretical perspective, this research applied legitimacy theory, suggesting that greater disclosure correlates with better outcomes for businesses. This was consistent with Masud et al. (2024), who showed that extensive ACD reduced threats to corporate legitimacy in society, facilitating positive relationships with societal legitimacy processes. By increasing transparency about corruption, companies communicated a strong message of opposition to corruption and unethical practices.

This research had certain limitations, particularly in the subjective scoring of ACD and DI indicators, which led to differing interpretations among researchers. Some disclosed items were overlooked due to the absence of direct verification with companies, introducing potential bias. Additionally, the results of the moderation test showed that IC, as homologized moderators, neither strengthened nor weakened the relationship between independent variables and ACD.

Future research should address data subjectivity by including additional reviewers for content analysis verification. These should also explore alternative moderating variables that are better suited to enhancing the effect of independent variables on ACD.

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