

# Achieving Operational Efficiency through Risk Disclosure

Septy Nur Sulistyawati and Ani Wilujeng Suryani\*

## ABSTRACT

**Manuscript type:** Research paper

**Research aims:** This study aims to investigate the effect of risk disclosure and CEO age on the operational efficiency.

**Design/Methodology/Approach:** A quantitative study was undertaken on 130 manufacturing firms listed on the Indonesian Stock Exchange in 2019. Risk disclosure was evaluated through the content analysis, while operational efficiency was measured using the Data Envelopment Analysis (DEA) technique. The data was analysed by utilising weighted least square regression.

**Research findings:** Results show that risk disclosure positively affects operational efficiency. The effect on CEO's age however, is not substantial. These findings imply that a company becomes more efficient when it discloses more risk, while the CEO's age has no bearing on the efficiency attained. Risk disclosure operates as a form of risk awareness that demonstrates management's commitment to resolving the problems.

**Theoretical contribution/Originality:** This study addresses the gap in the literature by empirically assessing how risk disclosure affect firms' efficiency in developing countries. It also expands on previous literature by considering CEO age as determinant of the efficiency. The findings of the study support the stakeholder theory

---

\* Corresponding Author: Ani Wilujeng Suryani is a Lecturer at the Accounting Department, Universitas Negeri Malang, Indonesia. Email: ani.suryani@um.ac.id  
Septy Nur Sulistyawati is a Graduate Student at the Accounting Department, Universitas Negeri Malang, Indonesia. Email: septysulistyawati15@gmail.com

in which a company must consider its key stakeholders, especially those who encourage it to improve its efficiency, and hence, risk disclosure is required.

**Practitioner/Policy implications:** This research suggests companies to disclose more to improve operational efficiency. It also recommends investors to invest in firms committed to risk disclosure.

**Research limitation/Implications:** In this study, risk disclosure was measured by the number of risks disclosed in the annual report and did not consider other sources. Therefore, future studies should further explore risk disclosure in different media, such as the newspaper, corporate websites, and social medias. Additionally, this study was conducted based on one industry sector, and hence, future studies may incorporate broader range of industries to capture the impact of CEO characteristics.

**Keywords:** CEO Age, Data Envelopment Analysis (DEA), Operational Efficiency, Risk Disclosure

**JEL Classification:** M41

## 1. Introduction

The competition among companies is becoming more intense with the growing number of manufacturing firms (Indonesian Stock Exchange, 2019; Lin & Tsai, 2016). Globalisation has also contributed to the accelerated dynamics of world competition (Ensari, 2018). This fierce international competition brings modern manufacturing companies under pressure to pursue operational advantages (Kulkarni et al., 2018). Rapid market development has also resulted in products in a situation where the supply exceeds the demand (Jian et al., 2020), escalating the competition between companies. Consequently, companies have to improve their operational efficiency to survive in this highly dynamic and competitive situation (Samoilenko & Osei-Bryson, 2013). An operational efficiency can be obtained by optimizing input and output (Yu et al., 2018). The company's inputs are the resources utilised during the production process; while the output is represented by the obtained revenue. A company is an efficient company when it has the capability to produce more output at the same or lower input rate (Derouiche et al., 2020).

Risk disclosure may help a firm improve operational efficiency by allowing it to access the resources it needs to lower costs and raise gross margins (Derouiche et al., 2020). Those advantages occur because suppliers view risk disclosure as demonstrating the company's accountability (Buckby et al., 2015) and credibility

(Derouiche et al., 2020). Additionally, extensive disclosure reduces agency issues and increases the company's performance (Easley & O'Hara, 2004). Finally, operational efficiency is closely connected to the company's performance because it reduces the cost per unit for input while increasing the gross margin to generate profit (Miller, 1987).

Prior studies have investigated the role of risk disclosure made by firms, although risk disclosure have been criticised as too narrow (Bao & Datta, 2014), not comprehensive and barely change (Abraham & Shrivess, 2014) because manager do not wish to disclose valuable/sensitive information, which might be exploited by others including industry competitors. However, a more recent study has found that the risk disclosure has been potentially utilised to improve the informativeness of the firms to meet the expectations of stakeholders by overcoming the limitations of annual reports (Guthrie et al., 2020). This finding is also supported by the notion that risk disclosure can reduce information asymmetry (Barakat & Hussainey, 2013; Moumen et al., 2015) and hence, bring positive impacts to the firm in the form of improvement of firm values/stock returns (Campbell et al., 2014; Chung et al., 2016; González et al., 2021; Li, 2008) or reduction in volatility (Edmonds et al., 2015; Hao & Dong, 2022; Kothari et al., 2009).

Many of previous literature, however, have investigated the determinants of risk disclosure from a broad array of corporate governance indicators (see for example Abdallah et al., 2015; Amrin, 2019; Domínguez & Gámez, 2014). Little has connected risk disclosure with a firm's efficiency. Research on the effects of risk disclosure remains limited, many of its advantages are left unexplored (Bravo, 2017). Elberry and Hussainey (2020) found that corporate investment efficiency affects voluntary disclosure practices positively. Derouiche et al., (2020), on the other hand, placed efficiency as the dependent variable and found that more risk disclosure results in better operational efficiency. Thus, there is a lot of room for research into the impact of risk disclosure on operational efficiency. Unlike previous studies, our study enhances prior literature by involving the characteristics of the chief executive officer (CEO) measured by age. It aims to determine the role of CEO's age on companies' operations. A company's efficiency has become one of the most essential decisions made by the management team. Thus, the manager's preferences and characteristics impact a company's decisions (Faccio et al., 2016).

Studies examining CEO's characteristics have demonstrated that they have a significant influence on the firms' output (Crossland & Hambrick, 2011), which are increasing over the time (Quigley & Hambrick, 2014). Besides, the CEO also closely observes the company's performance since it affects their current and future personal wealth (Petrou & Procopiou, 2016). Previous studies have revealed different performances among young and old CEOs (Andreou et al., 2017; Serfling, 2014). Companies managed by young CEOs tend to experience stock price decline (Andreou et al., 2017). In contrast, the elderly CEOs mostly generate higher revenue since they can maintain a low operational cost (Serfling, 2014). While previous literature on CEO characteristics have documented the effect of CEOs' age on investment efficiency (Gan, 2019) and working capital efficiency (Faccio et al., 2016), there is lack of study has investigated its effects on operational efficiency. Therefore, this study aims to examine the effects of risk disclosure and the CEO's characteristics on the company's operational efficiency. This study used data development analysis (Charnes et al., 1978) to measure the efficiency score and risk classification established by Linsley and Shrivess (2005) and Geraldina (2017) to estimate the risk disclosure level. Being the first study on risk disclosure's effect on companies' operational efficiency conducted in Indonesia, this study generates empirical evidence of the importance of risk disclosure for manufacturing companies' operational efficiency.

The remainder of this paper is organised into four parts. Following the introduction, Section 2 discusses the literature review and hypothesis development. It is then followed by Section 3, which explains on the research method. Section 4 provides a discussion on the research findings. Finally, the last section concludes the paper by explaining on the implications, and suggestions for future research.

## **2. Indonesian Context**

In Indonesia, information about firms' risks is not regulated and does not have a standardised form. The Indonesian legislation of Limited Liability Company mandates the board of directors to disclose the issues occur during the accounting year (Law No 40 of 2007 Article 66, 2d). In addition, the Financial Services Authorities requires the public companies to include the director report on the challenges faced by the company and an analysis of the business prospects. In relation to the good corporate governance, a narrative on the implementation of risk management system, covering the type of risk and how to

manage them is also required (SE OJK No:16/SEOJK.04/2021, 2021). In practice, most listed Indonesian companies include in their annual report a section on risk factors explaining selected occurrences that could negatively affect their accounts in the upcoming years. As the Indonesian accounting professional is a member of the International Federation of Accountants, the accounting standards follow the International Financial Reporting Standards (IFRS), and consequently companies also extensively report on financial risks, in accordance with the requirements of IFRS.

In general, manufacturing companies in Indonesia are faced with several phenomena that lead to several risks. First, with regard to sales stability, manufacturing companies are challenged with sales volatility as a result of rising coal and oil prices, increasing labour costs, and a weakening of exchange rate (Bagu et al., 2021). The closure of factories in several countries owing to a lack of energy supply has also influenced the demand for commodities of the manufacturing industry in Indonesia. The emergence of the COVID-19 pandemic has further become one of the problems facing manufacturing companies (Santia, 2021). These conditions pressure companies to quickly adapt and create new approaches that are relevant to be applied so that companies can survive and continue to operate optimally.

### **3. Theoretical Framework and Hypothesis Development**

The stakeholder theory specifies that a company has an obligation to integrate the interests of different stakeholders (Carroll, 1988), primarily substantial stakeholders such as suppliers, creditors, and customers (Derouiche et al., 2020). In a first step, we use a data envelopment analysis output-oriented variable returns to scale model to determine firm operational efficiency scores based on one output (i.e., sales revenue). These stakeholders are important since they provide the required resources, hence, motivating the management to increase their credibility to attain easier access to resources (Lockett et al., 2009). The connection between risk disclosure and operational efficiency in this study is examined from the stakeholders' perspective.

Based on this theory, a company with risk disclosure has a higher chance of attaining an excellent reputation and recognition from the stakeholders (Carroll, 1988; Donaldson & Preston, 1995). Risk disclosure benefits a company's reputation for a variety of

reasons. First, it represents management's awareness of internal and external threats (Jia et al., 2016). This awareness allows the company to be more efficient in making decisions (Kleffner et al., 2003). Second, risk disclosure shows the stakeholders' accountability and conformity to the proper company's management (Buckby et al., 2015). Third, it establishes a sense of legitimacy, trust, and respect between a company and stakeholders since the risk disclosure reflects the company's commitment toward its stakeholders (Al-Hadi et al., 2016). Fourth, it demonstrates the company's credibility in obtaining the required resources at a reasonable price, reducing the operational costs, increasing gross margin and operational efficiency (Derouiche et al., 2020).

In this study, efficiency is the ability of the decision-making unit (DMU) to attain the maximum output from the available input (Farrell, 1957). Operational efficiency occurs from a precise combination of production processes, workforces, and technologies that improves productivity and adds value to each business operation carried out while lowering normal operating costs (Kanghwa, 2010). An efficient company generates the utmost output using the limited available input (Derouiche et al., 2020). Three approaches can be used to measure this efficiency: the ratio, regression, and frontier approaches (Blanc et al., 2008). This study used the frontier approach, the data envelopment analysis (DEA), because it has a broader and more comprehensive scope than the other approaches (Jacobs et al., 2016).

Prior studies have found various factors that increase companies' efficiency. For example, more informative disclosure policies improve the economic allocation efficiency (Bertomeu et al., 2011; Pae, 2002) while the intangible assets admission increases the process efficiency, raising the allocation of resources (Goldstein & Yang, 2017; Kanodia & Sapra, 2016). In addition, the disclosure of capital supply can improve investment efficiency (Dutta & Nezlobin, 2017; Lai et al., 2014). However, only a study conducted by Derouiche et al., (2020) demonstrated that risk disclosure increases the company's operational efficiency. For this reason, this study focuses on the risk disclosure effects on operational efficiency from the perspective of a developing country.

Operational efficiency is also affected by the source of the input and by the generated output. Various ways are carried out to achieve that efficiency, including disclosing the risks. Risk represents the uncertainty related to the profit and loss potential (Solomon et al.,

2000). Risk disclosure consists of information related to the possible danger or exposure that has carried effects or possible effects for the company in the future (Kravet & Muslu, 2013; Linsley & Shrives, 2005). The company can disclose the risks in its annual report to present information about possible opportunities, the danger of loss, or a threat that may affect its survivability (Linsley & Shrives, 2005).

Risk disclosure is perceived as a meaningful aspect (Gonidakis et al., 2020). The number of risks disclosed by a company improves operational efficiency in three ways. First, it reduces the asymmetrical information between the principal and agent to make a better policy. Second, it improves the company's image and loyalty to better negotiate with the primary stakeholders. Third, risk disclosure also represents the risk awareness of a company (Li et al., 2019). Risk awareness creates a more competent decision-making process within the company that positively affects operational efficiency (Kleffner et al., 2003). Therefore, the formulated hypothesis in this study is:

H<sub>1</sub>: Risk disclosure has positive effects on operational efficiency.

Operational efficiency also relies on the company's management policies. Therefore, human resources play a significant role in the firms' accomplishments. Human resources in an organisation consist of a collection of competencies, knowledge, and individual social characteristics that combine to form intrinsic values (Hambrick et al., 1984). The CEO's knowledge has become a substantial aspect of attaining company's competitive superiority (Wagner & Pfeffer, 1984; Williams, 2013). Results of previous research have identified CEO as an exclusive individual due to his/her position and role (Lange et al., 2014). Therefore, CEO's or manager's characteristics and behaviour have become striking research topics. CEOs are chosen because they have a strong influence on organisational outcomes (Crossland & Hambrick, 2011). Further, those effects grow as time goes on (Quigley & Hambrick, 2014). The CEO's decisions are affected by their demographic attributes such as educational level, ethnicity, and gender (Lee et al., 2018; Mun et al., 2020). Unlike those demographic attributes, age represents a group of individual characteristics that includes the experiences gathered by someone (Goergen et al., 2015). Age is a set of human personality factors that influence behaviour, communication, strategic decision making, processing and use of information, risk-taking, and commitment to work (Child, 1973; Hambrick et al., 1984).

Age reflects personal capabilities and mental maturity (Kwalomine, 2017). Those two aspects determine different decisions made by CEOs, resulting in different accomplishments (Andreou et al., 2017; Faccio et al., 2016; Gan, 2019; Serfling, 2014). In addition, physiological transformation also influences decision-making and performance (Cline & Yore, 2016). Some studies have confirmed that CEO's age carries effects on the obtained performance, with older age tends to positively influence the firm performances (Faccio et al., 2016; Gan, 2019; Serfling, 2014). While younger CEOs have fewer experiences that lead to poor decisions, older CEOs generate more ethical decisions (Serfling, 2014). CEO's age has also affects investment efficiency positively (Gan, 2019; Xie, 2015). However, its effect on company performance, such as operational efficiency, has not been investigated deeply. According to the CEO's role in a company's decision-making process, CEOs' characteristics result in different performance. Thus, there is a possible connection between the CEO's age and a company's operational efficiency. This effect appears as a result of the CEO's capabilities. Therefore, the second hypothesis in this study is:

H<sup>2</sup>: CEO's age has positive effects on operational efficiency.

#### **4. Research Design**

This explanatory quantitative study investigates the relationship between risk disclosure, the CEO's age, and the operational efficiency of the manufacturing companies listed on the Indonesia Stock Exchange. The manufacturing companies were selected since their main venture is in line with the efficiency concept, processing input-output (Kaltsum & Sebrina, 2019). The efficient manufacturing sector is also essential in solving unemployment issues and creating sustainable economic growth (Asaleye et al., 2018). This study's samples were selected from manufacturing companies listed on the Indonesian Stock Exchange in 2019 (n=193). The year 2019 was selected since the listed companies increased significantly in Indonesia during that year, creating tighter competition among companies (Indonesian Stock Exchange, 2019). We then excluded companies that did not release annual reports (n=29) and experienced losses (n=34), resulted in 130 data sets.

The manufacturing companies sampled in this study consist of the basic materials, consumer cyclicals, consumer non-cyclicals, healthcare, and industrials sectors (Indonesian Stock Exchange, 2021). The existence of the manufacturing industry in Indonesia is very important because the Manufacturing Value Added (MVA) for the largest manufacturing production base in the Southeast Asia region and the Indonesian economy is currently dominated by manufacturing industry (Ministry of Industry, 2021). This large contribution from the manufacturing sector has also led Indonesia to become the only ASEAN country that is a member of the G20. The manufacturing industry for Indonesia is the leading sector that provides the largest economic contribution when compared to other industries. This was evidenced by the substantial contribution of the manufacturing industry to GDP in 2019 (20.79%) and in 2020 (20.61%) (Statistics Indonesia, 2020).

In this study, a content analysis approach with a binary coding scheme was used to quantify risk disclosure, as conducted by Oliveira et al. (2011). The risk disclosure assessment is based on the risk items that have been developed by Linsley & Shrivess, (2005) as presented in Table 1. Coding is accomplished by assigning a score of one to the unit of analysis in the form of a phrase that includes information on each risk item. This scoring is only performed once. If it is found that the company discloses a risk more than once, it will still be assigned a code of one. This coding system is not intended to count the amount of a risk stated by the firm, but rather to assess whether a risk exists in the company. The coding results are then summed up for each company to obtain the value of the risk disclosure variable. In creating a valid conclusion from a text, the classification procedure should be reliable and consistent (Weber, 1990). Consequently, this study used an independent coder to establish coding consistency. The results of the first coding indicated a relatively low kappa score (0.4). The codebook was then improved, and a recoding was carried out (Suryani et al., 2018). The kappa coefficient in the second coding was satisfactory (0.871), and hence, the codebook was classified as reliable and fulfilling (Landis & Koch, 1977).

Table 1. List of Risk Disclosure Items/Themes

Risk Disclosure Items/Themes	
<i>Financial risk*</i>	<i>Information processing and technology risk**</i>
<ul style="list-style-type: none"> <li>• Credit liquidity</li> <li>• Market (commodity/present value)</li> <li>• Interest rate</li> <li>• Exchange rate</li> <li>• Contingent risk</li> </ul>	<ul style="list-style-type: none"> <li>• Access</li> <li>• Availability</li> <li>• Infrastructure</li> </ul>
<i>Operational risk**</i>	<i>Integrity risk**</i>
<ul style="list-style-type: none"> <li>• Customer satisfaction</li> <li>• Product development</li> <li>• Efficiency and performance</li> <li>• Resources</li> <li>• Inventory obsolescence and depreciation</li> <li>• Product and service failure</li> <li>• Environmental</li> <li>• Health and safety</li> <li>• Brand name erosion</li> </ul>	<ul style="list-style-type: none"> <li>• Fraud by management or employee</li> <li>• Illegal act</li> <li>• Reputation</li> </ul>
	<i>Strategy risk**</i>
<ul style="list-style-type: none"> <li>• Leadership and management</li> <li>• Outsourcing</li> <li>• Performance incentives</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental scanning</li> <li>• Industry</li> <li>• Business portfolio</li> <li>• Competitors</li> <li>• Pricing</li> <li>• Valuation</li> <li>• Planning</li> <li>• Life cycle</li> <li>• Performance measurement</li> <li>• Regulation</li> <li>• Sovereign and political</li> </ul>

Notes: \*mandatory disclosure, \*\* voluntary disclosure (Linsley & Shrive, 2005)

Similar to previous studies, this study used the DEA model to measure operational efficiency (Cheng et al., 2018; Derouiche et al., 2020). A relatively efficient company has a DEA score equals to one (Derouiche et al., 2020). Data Envelopment Analysis is a well-known non-parametric tool for assessing operational efficiency and performance (Abbasi & Kaviani, 2016). The DEA technique is commonly used to study and compare the activities of the decision making unit (DMU) in the same group (Golany & Yu, 1997; Min & Joo, 2009). The DEA was chosen as a method to measure operational

efficiency because it has a broader and more comprehensive than a simple ratio matrix (Jacobs et al., 2016). Furthermore, some techniques are quite challenging to handle the use of many inputs (Filardo et al., 2017). The DEA calculation model assesses operational efficiency by establishing optimal production limits based on program optimisation in order to maximise the output-to-input ratio (Cheng et al., 2018). The DMU is stated to be relatively efficient in the DEA model when it has a score of one, hence the value of one becomes the efficiency limit (Derouiche et al., 2020).

This study used sales revenue as the output since it is the primary revenue source from the firm’s operational activities. Meanwhile, the net property, plant, and equipment, along with the costs of goods sold (COGS) and selling, general and administrative expenses (SG&A) were used as an input. The formula to calculate efficiency in DEA is presented in equation 1.

$$\text{Operational Efficiency} = \max \frac{\sum_{i=1}^m u_i \cdot y_s}{\sum_{j=1}^n v_j \cdot x_s} \quad (1)$$

Where,

- $m$  = the total investigated output DMU
- $n$  = the number of investigated input DMU
- $y_s$  = the amount of produced output per- DMU
- $x_s$  = the number of produced input per- DMU
- $i_i$  = the weight of produced output per- DMU
- $v_j$  = the weight of produced input per- DMU

Equation 1 involves the weight of the input and output so that the efficiency score of each DMU can be maximised with all efficiency scores that should be equal to or lower than one. It lead to a new issue that the ratio has a total infinite solution, requiring score limitation using equation 2 to 6.

$$\max \sum_{i=1}^m u_i \cdot y_s \quad (2)$$

limitation:

$$\sum_{j=1}^n v_j \cdot x_s = 1 \quad (3)$$

$$\sum_{i=1}^m u_i \cdot y_s - \sum_{j=1}^n v_j \cdot x_s \leq 0 \tag{4}$$

$$u_i \geq 0 \tag{5}$$

$$v_j \geq 0 \tag{6}$$

This study used the solver feature of Excel to calculate the operational efficiency. To ensure validity, a recalculation was carried out using the DEAP application version 2.1. Those two programs revealed the same results for all samples, and hence, the DEA in this study was considered valid and useable.

The CEO's age was measured using the difference between the year of birth and the annual report period (Barker & Mueller, 2002). As carried out in the study of Derouiche et al. (2020), this study controlled for the company size measured by the Ln total asset and the company's age. The regression equation is presented below.

$$\text{Operational Efficiency} = \alpha + \beta_1 \text{Risk Disclosure} + \beta_2 \text{CEO Age}_i + \text{Error}_i \tag{7}$$

$$\text{Operational Efficiency} = \alpha + \beta_1 \text{Risk Disclosure} + \beta_2 \text{CEO Age}_i + \beta_3 \text{Control Firm Age}_i + \beta_4 \text{Control Firm Size}_i + \text{Error}_i \tag{8}$$

Where;

$\alpha$  = constant ;

$\beta_1 - \beta_4$  = regression coefficient

Hypothesis testing in this study involves regression analysis, hence it is important to verify the classical assumptions first. The classical assumption test consists of normality test, multicollinearity test, and heteroscedasticity test. This study did not examine the autocorrelation because of the cross section and one year data. The results of the normality test employing skewness kurtosis showed that all variables in this study were normally distributed. The result of the multicollinearity test revealed that the Variance Inflation Factor (VIF) value was less than 4. This shows that all variables have

passed the multicollinearity test (Hair et al., 2019). The findings of the heteroscedasticity test utilising the Glejser test demonstrated that there were indications of heteroscedasticity. Thus, OLS (Ordinary Least Square) cannot be performed (Gujarati, 2003). The most acceptable technique to overcome this is by using the Weighted Least Square (WLS) regression since it can construct the Best Linear Unbiased Estimator (BLUE) equation on data exhibiting signs of heteroscedasticity (Gujarati, 2003).

## 5. Results and Discussion

As shown in Table 2, the responding companies generated 0.59 sales revenue using the same number of resources. The lowest efficiency score was observed at PT Surya Eka Perkasa, which may be caused by the high value of net property plants and equipment usage to support the company's production process. In contrast, the highest efficiency score was recorded by 15 companies out of 130 samples. Thus, 11.5 per cent of manufacturing companies in 2019 were relatively efficient. Of the 34 items for risk disclosure, the sample companies in average disclosed only 8 items. This situation may be caused by the perception that the emergence of risk disclosure in the annual report reduces the excellence of their competitive products in the market (Ahmad et al., 2021). For this reason, companies minimise their risk disclosure. The most disclosed risks were exchange rate risk (n=112), competitor risk (n=101), and resources risk (n=100). The exchange rate risk signifies that the company currently faces a fluctuation in foreign currency exchange rates. Meanwhile, the competitor risk shows that the company encounters ambitious business competition caused by the growing number of listed companies (Indonesian Stock Exchange, 2019). The resources risk indicates that the company recently experiences risk on the fulfilment of their raw material.

Table 2. Descriptive Statistic

Variable	Min	Max	Mean	SD
Operational efficiency	0.100	.999	0.590	0.237
Risk disclosure	2.000	17.000	8.560	3.297
CEO age	33.000	82.000	56.380	10.329
Firm size	8.600	17.050	12.120	1.690
Firm age	5.000	106.000	39.580	18.975

The lowest risk disclosure was recorded by PT Garuda Metalindo (resource and political risk) and PT Pelangi Indah Canindo (resources and environmental risks). These two companies had similarities in the resources of risk. In relation to that, around 70 per cent of the industry in Indonesia still imports raw materials from China (Nurcahya, 2021). Thus, this situation creates a material availability risk for the majority of Indonesian manufacturing companies. Meanwhile, the highest risk disclosure was observed at the PT Unilever, with 17 risk items. Compared to other companies, PT Unilever paid closer attention to its risk profile. As presented in its annual report “In a highly dynamic and competitive market, the success of our business depends on our ability to identify and capture opportunities as they emerge without taking on an undue level of risk” (Unilever, 2019; p206). Related to the types of risks that are widely disclosed by companies, this study groups risk disclosures based on the sub-sector of manufacturing companies (see Table 3). Based on these findings, it appears that there are no different types of risk for each sub-sector. These findings indicate that in general all companies face the same risks.

Table 3. Risk Disclosure Between Manufacturing Sub Sectors

Sector	No. of companies		Exchange Rate Risk		Resources Risk		Competitors Risk		Total risk disclosed
Basic Materials	43	33.1%	36	34.6%	36	34.6%	32	30.8%	104
Consumer Cyclicals	25	19.2%	21	35.6%	19	32.2%	19	32.2%	59
Consumer Non-Cyclicals	36	27.7%	33	35.1%	30	31.9%	31	33.0%	94
Healthcare	9	6.9%	8	36.4%	7	31.8%	7	31.8%	22
Industrials	17	13.1%	14	41.2%	8	23.5%	12	35.3%	34
Total	130	100%	110		98		101		313

Risk disclosure can be different between countries due to numerous things, such as, differences in rules and culture (Dobler et al., 2011) as well as corporate size (Amran et al., 2009). For example, in the U.S. and Canada, companies are required to disclose quantitative and qualitative information concerning market risk in the notes of financial statements and be part of a Management Discussion

Analysis (MDA). Meanwhile, in Germany, GAS5 requires risk information to be presented in a separate section of the management report. In Australia, risk management is part of excellent corporate governance. In ASEAN nations such as Indonesia and Malaysia, different regulation applies whereby risk disclosure other than financial risk is voluntary (Amran et al., 2009).

Table 2 also shows that the average CEO's age was 56 years old, with the youngest CEO observed at PT Eratex Djaja (33 years old), while the oldest CEO was from PT Emdeki Utama (82 years old). This finding is similar to the results of a previous study that has revealed the average CEO's age as 56-57 years old (Mardini & Lahyani, 2020; Mun et al., 2020) this study examines the impact of financial performance (FP). It signifies that the CEO has a different position from the executive in the public sector due to their retirement age (Souder et al., 2012). The samples in this study are classified as a medium industry (Irawati, 2012). They are also categorised as old companies, with an average age of 40 years old. The youngest company was PT Waskita Beton Precast Tbk (5 years old), while the oldest was PT Hanjaya Mandala Sampoerna Tbk (106 years old).

As presented in Table 4, operational efficiency positively correlates with risk disclosure in the medium range, meaning that the increase in risk disclosure accelerates operational efficiency. Risk disclosure lower asymmetrical information and helps the company to take a strategic and efficient move. The CEOs' age, company size, and company age did not significantly correlate with operational efficiency. However, the correlation between CEOs' age and operational efficiency is negative, indicating the possibility of an inefficient company managed by a relatively younger CEO.

Table 4: Correlation

Variable	(1)	(2)	(3)	(4)	(5)
(1) Y ( <i>Efficiency Operational</i> )	1				
(2) X <sub>1</sub> ( <i>Risk disclosure</i> )	0.392**	1			
(3) X <sub>2</sub> ( <i>CEO age</i> )	-0.062	-0.071	1		
(4) Z <sub>1</sub> ( <i>Firm size</i> )	0.102	-0.018	0.091	1	
(5) Z <sub>2</sub> ( <i>Firm age</i> )	0.047	-0.088	0.161*	0.379**	1

Note: \*significant at  $p < 0.05$ ; \*\*significant at  $p < 0.001$

In addition, on a medium scale, a positive correlation was also observed between the company's age and size. It indicates that as the company grows older, the size gets bigger. A low correlation was detected between the company's age and the CEO's age. It signifies that the old companies tend to be managed by relatively older CEOs in the manufacturing companies. The CEO of some companies in this study is also the owner of the companies.

As presented in Table 5, the R<sup>2</sup> of Model 1 shows that risk disclosure and CEOs' age explained 16.8% of the variation in operational efficiency. In Model 2, the addition of the control variables (firm size and firm age) increased the R<sup>2</sup> to 17.2%, indicating that those variables improve the interaction between the dependent and independent variables.

Table 5: Results of Regression Analysis

Variables	Model 1			Model 2		
	$\beta$	t-stat	p-value	$\beta$	t-stat	p-value
Constant	0.369			0.268		
X <sub>1</sub> ( <i>Risk disclosure</i> )	0.028	4.876	0.000*	0.028	4.805	0.000*
X <sub>2</sub> ( <i>CEO age</i> )	0.000	-0.165	0.869	0.000	-0.198	0.843
Z <sub>1</sub> ( <i>Firm size</i> )				0.009	0.721	0.472
Z <sub>2</sub> ( <i>Firm age</i> )				0.000	0.145	0.885
F	12.018*			6.068*		
R <sup>2</sup>	0.168			0.172		

Note: \*significant at p < 0.001

### 5.1 The Effects of Risk Disclosure on the Operational Efficiency

Table 5 shows a positive relationship between risk disclosure and operational efficiency, demonstrating that increasing risk disclosure improves decision-making efficiency on the allocation of resources. It is consistent with a recent study that found a positive effect of risk disclosure on operational efficiency (Derouiche et al., 2020). The disclosure of risk information enhances operational efficiency because it reflects the managers' keen interest and awareness in disclosing the risk and implementing the risk management strategy (Derouiche et al., 2020; Jia et al., 2016). The more risk are disclosed, the

more aware the management team is of the possible threat, resulting in a more appropriate risk management strategy, and ensuring the company's going concerned (Ji & Tan, 2016). Furthermore, risk disclosure exposes the company's responsiveness to critical issues, allowing them to have a greater commitment in resolving the issue (Al-Hadi et al., 2016; Basoglu & Hess, 2014). Elshandidy et al. (2013) found that high-risk companies are sensitive to the degree of risk they face, resulting in more disclosure. The awareness of risk they confront enables the management team to efficiently and effectively make decisions that affect operational efficiency (Kleffner et al., 2003).

According to stakeholder theory, company influences and is influenced by stakeholder's groups with diverse expectations (Deegan, 2000). Stakeholders expects having enough information relating to risk and opportunities, and when the stakeholders are resource suppliers, they are able to affect company's performance (Guthrie et al., 2020). For this reason, it is important to manage and balance relationships with stakeholders through risk disclosure. The results of this study further support the notion that risk disclosure lowers asymmetrical information between stakeholders and the management, allowing the company to produce appropriate and efficient decisions. Moreover, operational efficiency can be affected by risk disclosure through the impact of the disclosure on profit margins, the sales and the expenses needed in the operating process (Derouiche et al., 2020). Hence, risk disclosure improves firm's value (Abdullah et al., 2015) and performance (Dey et al., 2018).

This study provides an empirical evidence that risk disclosure from manufacturing companies increases their operational efficiency, potentially as a result of stakeholders' positive perceptions of companies' commitment to communicating their risk (Derouiche et al., 2020; Loughran, 2018). Manufacturing companies face significant risks and pressure from current policies and norms to disclose their risks so that stakeholders value the risk disclosure (Reguera-Alvarado & Bravo-Urquiza, 2020). Risk information is particularly important for stakeholders since it reflects a company's operational sustainability (Mcchlery, 2021). As a result, the management is willing to disclose negative events experienced by the company (Gordon et al., 2010; Reguera-Alvarado & Bravo-Urquiza, 2020) to obtain feedback in the form of better stakeholders' negotiation results (Derouiche et al., 2020).

## 5.2 *The Effects of the CEO's Age toward the Operational Efficiency*

As shown in Table 5, the regression analysis indicates that the CEOs' age had no significant impact on operational efficiency. It contradicts earlier studies (Gan, 2019; Xie, 2015) but supports the idea that CEOs' age carries no essential effect on the companies' efficiency (Ullah et al., 2020), companies' strategic act (Wang et al., 2016) and performance (Liu & Jiang, 2020). Xie's (2015) study, which focused on CEOs from Chinese companies who encounter long-term career issues, indicates that younger CEOs tend to be more cautious in making a decision. Meanwhile, since firm CEOs in Indonesia do not have a retirement age, long-term career is not a concern. Therefore, the CEO's age does not influence operational efficiency.

The age diversity of the board members may indicate that the ages of CEOs have no influence on the operational efficiency. This diversity creates distinctive perspectives during the decision-making process because the members come from different generations with different experiences and exclusive values (Ullah et al., 2020). Some previous studies have found a connection between CEO's age and the company's strategic decisions (Cannella et al., 2009). However, the strategic decisions made by big companies are frequently made by a team of members of various ages (Belenzon et al., 2019), thus the CEO does not have complete control over the decision.

In the companies' organisational structure, the board of directors is authorised to supervise the CEOs (Li & Roberts, 2017; Xu et al., 2017). The presence of board directors in a company ensures that the CEO's age has no impact on the operational efficiency. Their supervision directs and guides the CEO to behave in accordance to their instructions and recommendations (Li & Roberts, 2017). As a result, the age of the CEOs age has no strong influence on the company's performance. Moreover, human capital is more important for service firms than for manufacturing companies (Belenzon et al., 2019).

## 6. **Conclusions, Limitations, and Recommendation**

The growing competition in the manufacturing industry has become a significant issue for companies. To thrive in these rapidly changing industrial dynamics, companies must enhance their operational efficiency. Companies may accelerate their operational efficiency by taking a variety of steps, such as by understanding the risks

and disclosing them. Risk disclosure has been the subject of many studies in business, but none have demonstrated the impact of risk disclosure on operational efficiency. Efficiency is closely related to the companies' policies. The policies are the result of a discussion among company's managements, which includes the CEO. Every CEO has unique and distinctive characteristics. The impact of risk disclosure and the CEO's age on operational efficiency is investigated in this study.

From a theoretical perspective, our results offer useful insight in light of stakeholder theory. Based on the results of this study, risk disclosure carries a positive influence on operational efficiency. This shows companies' awareness of managing and reporting risks. In turn, this risk disclosure is perceived useful by stakeholders as it reflects the company's vulnerability to present, past, and future risks. This sensitivity also reflects the company's dedications to dealing with the risks it confronts. As a result, risk disclosure is beneficial for companies.

This study presents the implication that every business is affected by uncertainty. Therefore, the disclosure of information related to risks has had a favourable impact on the companies. Furthermore, the findings in this study show that the risk disclosure from the manufacturing industry in Indonesia is relatively low. Hence, the policy-maker should provide a more relevant risk disclosure guideline for the management to generate a more comprehensive risk disclosure. This study also contributes to the company's management understanding on the effects of risk disclosure on operational efficiency. It also assists investors in making investment decision on companies with the commitment to disclose their risk widely.

The results of this study should be carefully generalised because in this study, risk disclosure was measured by the number of risks disclosed in the annual report and did not consider other sources. Therefore, future studies should further explore risk disclosure in different media, such as the newspaper, corporate websites, and social medias. In this study, the operational efficiency was estimated using the DEA approach. Thus, future studies are suggested to use different approaches, for instance the robustness check. This study eliminates outliers when processing the data. Consequently, future research is expected to adopt other measures if issues with data normality appears. This study was unable to show the effects of CEO's age on operational efficiency possibly because it only involved

one industrial group. This offers opportunity for future studies to include a broader range of industries.

## References

- Abbasi, M., & Kaviani, M. A. (2016). Operational efficiency-based ranking framework using uncertain DEA methods: An Application to the cement industry in Iran. *Management Decision*, 54(4), 902–928. <https://doi.org/10.1108/MD-09-2015-0413>
- Abdallah, A.A.N., Hassan, M.K., & McClelland, P.L. (2015). Islamic financial institutions, corporate overnance, and corporate risk disclosure in Gulf Cooperation Council countries. *Journal of Multinational Financial Management*, 31, 63–82. <https://doi.org/10.1016/j.mulfin.2015.02.003>
- Abdullah, M., Shukor, Z.A., Mohamed, Z.M., & Ahmad, A. (2015). Risk management disclosure: A study on the effect of voluntary risk management disclosure toward firm value. *Journal of Applied Accounting Research*, 16(3), 400–432. <https://doi.org/10.1108/JAAR-10-2014-0106>
- Abraham, S., & Shrivies, P.J. (2014). Improving the relevance of risk factor disclosure in corporate annual reports. *The British Accounting Review*, 46(1), 91–107. <https://doi.org/10.1016/j.bar.2013.10.002>
- Ahmad, A., Muhammad, & Narullia, D. (2021). Corporate risk disclosure: The effect of corporate governance. *Journal of Applied Managerial Accounting*, 5(1), 101–113. <https://doi.org/10.30871/jama.v5i1.2794>
- Al-Hadi, A., Hasan, M. M., Taylor, G., Hossain, M., & Richardson, G. (2016). Market risk disclosures and investment efficiency: International evidence from the gulf cooperation council financial firms. *Journal of International Financial Management and Accounting*, 28(3), 349–393. <https://doi.org/10.1111/jifm.12063>
- Amran, A., Manaf Rosli Bin, A., & Che Haat Mohd Hassan, B. (2009). Risk reporting: An exploratory study on risk management disclosure in Malaysian annual reports. *Managerial Auditing Journal*, 24(1), 39–57. <https://doi.org/10.1108/02686900910919893>
- Amrin, A. (2019). An empirical study: Characteristics of business entities and corporate governance on risk disclosure practices. *Business: Theory and Practice*, 20, 25–49. <https://doi.org/10.3846/btp.2019.04>

- Andreou, P.C., Louca, C., & Petrou, A.P. (2017). CEO age and stock price crash risk. *Review of Finance*, 21(3), 1287–1325. <https://doi.org/10.1093/rof/rfw056>
- Asaleye, A.J., Adama, J.I., & Ogunjobi, J.O. (2018). Financial sector and manufacturing sector performance: Evidence from Nigeria. *Investment Management and Financial Innovations*, 15(3), 35–48. [https://doi.org/10.21511/imfi.15\(3\).2018.03](https://doi.org/10.21511/imfi.15(3).2018.03)
- Bagu, A., Karamoy, H., & Gamaliel, H. (2021). Analisis faktor-faktor yang mempengaruhi pemilihan pendanaan struktu modal eksternal pada perusahaan industri manufaktur di Indonesia yang terdaftar di bursa efek indonesia. *Jurnal Riset Akuntansi Dan Auditing "GOODWILL,"* 12(1), 72–84.
- Bao, Y., & Datta, A. (2014). Simultaneously discovering and quantifying risk types from textual risk disclosures. *Management Science*, 60(6), 1371–1391. <https://doi.org/10.1287/mnsc.2014.1930>
- Barakat, A., & Hussainey, K. (2013). Bank governance, regulation, supervision, and risk reporting: Evidence from operational risk disclosures in European banks. *International Review of Financial Analysis*, 30, 254–273. <https://doi.org/10.1016/j.irfa.2013.07.002>
- Barker, V.L., & Mueller, G.C. (2002). CEO characteristics and firm R&D spending. *Management Science*, 48(6), 782–801. <https://doi.org/10.1287/mnsc.48.6.782.187>
- Basoglu, K.A., & Hess, T.J. (2014). Online business reporting: A signaling theory perspective. *Journal of Information Systems*, 28(2), 67–101. <https://doi.org/10.2308/isys-50780>
- Belenzon, S., Shamshur, A., & Zarutskie, R. (2019). CEO's age and the performance of closely held firms. *Strategic Management Journal*, 40(6), 917–944. <https://doi.org/10.1002/smj.3003>
- Bertomeu, J., Beyer, A., & Dye, R. A. (2011). Capital structure, cost of capital, and voluntary disclosures. *Accounting Review*, 86(3), 857–886. <https://doi.org/10.2308/accr.00000037>
- Blanc, I., Friot, D., Margni, M., & Jolliet, O. (2008). Towards a new index for environmental based on a DALY weighting approach. *Sustainable Development*, 16(4), 251–260. <https://doi.org/10.1002/sd.376>
- Bravo, F. (2017). Are risk disclosures an effective tool to increase firm value ? *Managerial and Decision Economics*, 38(8), 1116–1124. <https://doi.org/10.1002/mde.2850>
- Buckby, S., Gallery, G., & Ma, J. (2015). An analysis of risk management disclosures: Australian evidence. *Managerial Auditing Journal*, 30(8/9), 812–869. <https://doi.org/10.1108/MAJ-09-2013-0934>

- Campbell, J.L., Chen, H., Dhaliwal, D.S., Lu, H. min, & Steele, L.B. (2014). The information content of mandatory risk factor disclosures in corporate filings. *Review of Accounting Studies*, 19(1), 396–455. <https://doi.org/10.1007/s11142-013-9258-3>
- Cannella, B., Finkelstein, S., & Hambrick, D.C. (2009). *Strategic leadership: Theory and research on executives, top management teams, and boards*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780195162073.001.0001>
- Carroll, A.B. (1988). Corporate strategy and the search for ethics. *Academy of Management Executive*, 3(2), 153–155. <https://doi.org/10.5465/ame.1989.4274767>
- Charnes, A., Cooper, W.W., & Rhodes, E. (1978). Measuring the efficiency of decision making units. *European Journal of Operational Research*, 2(6), 429–444. [https://doi.org/10.1016/0377-2217\(78\)90138-8](https://doi.org/10.1016/0377-2217(78)90138-8)
- Cheng, Q., Goh, B.W., & Kim, J. B. (2018). Internal control and operational efficiency. *Contemporary Accounting Research*, 35(2), 1102–1139. <https://doi.org/10.1111/1911-3846.12409>
- Child, J. (1973). Managerial and organizational factors associated with company performance - Part 1. *The Journal of Management Studies*, 11(3), 175–189. <https://doi.org/10.1111/j.1467-6486.1974.tb00693.x>
- Chung, D., Hrazdil, K., & Suwanyangyuan, N. (2016). Disclosure quantity and the efficiency of price discovery evidence from the Toronto Stock Exchange. *Review of Accounting and Finance*, 15(2), 122–143. <https://doi.org/10.1108/RAF-06-2015-0081>
- Cline, B.N., & Yore, A.S. (2016). Silverback CEOs: Age, experience, and firm value. *Journal of Empirical Finance*, 35, 169–188. <https://doi.org/10.1016/j.jempfin.2015.11.002>
- Crossland, C., & Hambrick, D. C. (2011). Differences in managerial discretion across countries: How nation-level institutions affect the degree to which CEOs matter. *Strategic Management Journal*, 32(8), 797–819. <https://doi.org/10.1002/smj.913>
- Deegan, C. (2000). *Financial accounting theory*. McGraw-Hill Book Company.
- Derouiche, I., Manita, R., & Muessig, A. (2020). Risk disclosure and firm operational efficiency. *Annals of Operations Research*, 297, 115–145. <https://doi.org/10.1007/s10479-020-03520-z>
- Dey, R.K., Hossain, S.Z., & Rezaee, Z. (2018). Financial risk disclosure and financial attributes among publicly traded manufacturing companies: Evidence from Bangladesh. *Journal of Risk and*

- Financial Management*, 11(3), 1–16. <https://doi.org/10.3390/jrfm11030050>
- Dobler, M., Lajili, K., & Zéghal, D. (2011). Attributes of corporate risk disclosure: An international investigation in the manufacturing sector. *Journal of International Accounting Research*, 10(2), 1–22. <https://doi.org/10.2308/jiar-10081>
- Domínguez, L.R., & Gámez, L.C.N. (2014). Corporate reporting on risks: Evidence from Spanish companies. *Revista de Contabilidad*, 17(2), 116–129. <http://dx.doi.org/10.1016/j.rcsar.2013.10.002>
- Donaldson, T., & Preston, L. E. (1995). The stakeholder theory of the corporation: Concepts, evidence, and implications. *Academy of Management*, 20(1), 65–91. <https://doi.org/10.5465/amr.1995.9503271992>
- Dutta, S., & Nezhlobin, A. (2017). Dynamic effects of information disclosure on investment efficiency. *Journal of Accounting Research*, 55(2), 329–369. <https://doi.org/10.1111/1475-679X.12161>
- Easley, D., & O'Hara, M. (2004). Information and the cost of capital. *Journal of Finance*, 59(4), 1553–1583. <https://doi.org/10.1111/j.1540-6261.2004.00672.x>
- Edmonds, C.T., Edmonds, J.E., Leece, R.D., & Vermeer, T.E. (2015). Do risk management activities impact earnings volatility? *Research in Accounting Regulation*, 27(1), 66–72. <https://doi.org/10.1016/j.racreg.2015.03.008>
- Elberry, N., & Hussainey, K. (2020). Does corporate investment efficiency affect corporate disclosure practices? *Journal of Applied Accounting Research*, 21(2), 309–327. <https://doi.org/10.1108/JAAR-03-2019-0045>
- Elshandidy, T., Fraser, I., & Hussainey, K. (2013). Aggregated, voluntary, and mandatory risk disclosure incentives: Evidence from UK FTSE all-share companies. *International Review of Financial Analysis*, 30, 320–333. <https://doi.org/10.1016/j.irfa.2013.07.010>
- Ensari, M.S. (2018). Competitive dynamics in Turkey. In Ozturkcan, S. & Okan, E.Y. (Eds.), *Marketing Management in Turkey* (pp. 165–198). Emerald Publishing Limited. <https://doi.org/10.1108/978-1-78714-557-320181013>
- Faccio, M., Marchica, M.T., & Mura, R. (2016). CEO gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of Corporate Finance*, 39, 193–209. <https://doi.org/10.1016/j.jcorpfin.2016.02.008>

- Farrell, M.J. (1957). The measurement of productive efficiency. *Journal of The Royal Statistical Society. Series A (General)*, 120(3), 253–290. <https://doi.org/10.2307/2343100>
- Filardo, A., Negoro, N. P., & Kunaifi, A. (2017). Penerapan data envelopment analysis dalam pengukuran efisiensi retailer produk kendaraan merek toyota. *Jurnal Sains Dan Seni ITS*, 6(1). <https://doi.org/10.12962/j23373520.v6i1.22309>
- Gan, H. (2019). Does CEO managerial ability matter? Evidence from corporate investment efficiency. *Review of Quantitative Finance and Accounting*, 52(4), 1085–1118. <https://doi.org/10.1007/s11156-018-0737-2>
- Geraldina, I. (2017). The quality of risk disclosure: Evidence from infrastructure industry in Indonesia. *Jurnal Dinamika Akuntansi Dan Bisnis*, 4(2), 211–230. <https://doi.org/10.24815/jdab.v4i2.8053>
- Goergen, M., Limbach, P., & Scholz, M. (2015). Mind the gap: The age dissimilarity between the chair and the CEO. *Journal of Corporate Finance*, 35, 136–158. <https://doi.org/10.1016/j.jcorpfin.2015.08.011>
- Golany, B., & Yu, G. (1997). Estimating Returns to Scale in DEA. *European Journal of Operational Research*, 103(1), 28–37. [https://doi.org/10.1016/S0377-2217\(96\)00259-7](https://doi.org/10.1016/S0377-2217(96)00259-7)
- Goldstein, I., & Yang, L. (2017). Information disclosure in financial markets. *Annual Review of Financial Economics*, 9, 101–125. <https://doi.org/10.1146/annurev-financial-110716-032355>
- Gonidakis, F. K., Koutoupis, A. G., Tsamis, A. D., & Agoraki, M. E. K. (2020). Risk disclosure in listed Greek companies: The effects of the financial crisis. *Accounting Research Journal*, 33(4/5), 615–633. <https://doi.org/10.1108/ARJ-03-2020-0050>
- González, M., Guzmán, A., Téllez, D.F., & Trujillo, M.A. (2021). What you say and how you say it: Information disclosure in Latin American firms. *Journal of Business Research*, 127(February 2018), 427–443. <https://doi.org/10.1016/j.jbusres.2019.05.014>
- Gordon, L.A., Loeb, M. P., & Sohail, T. (2010). Market value of voluntary disclosures concerning information security. *MIS Quarterly: Management Information Systems*, 34(3), 567–594. <https://doi.org/10.2307/25750692>
- Gujarati, D.N. (2003). *Basic econometrics* (4th ed.). McGraw-Hill Higher Education.
- Guthrie, J., Manes Rossi, F., Orelli, R.L., & Nicolò, G. (2020). Investigating risk disclosures in Italian integrated reports.

- Meditari Accountancy Research*, 28(6), 1149–1178. <https://doi.org/10.1108/MEDAR-10-2019-0596>
- Hair, J.F., Black, W.C., Babin, B.J., & Anderson, R.E. (2019). *Multivariate data analysis* (Eight). Cengage Learning, EMEA.
- Hambrick, D.C., Mason, P.A., & Mason, P.A. (1984). Upper echelons: The organization as a reflection of its top managers. *The Academy of Management Review*, 9(2), 193–206. <https://doi.org/10.5465/amr.1984.4277628>
- Hao, Y., & Dong, B. (2022). Determinants and consequences of risk disclosure: Evidence from Chinese stock markets during the COVID-19 pandemic. *Emerging Markets Finance and Trade*, 58(1), 35–55. <https://doi.org/10.1080/1540496X.2021.1964468>
- Indonesian Stock Exchange. (2019). *BEI Optimis Pasar Modal Indonesia Tetap Tumbuh Positif*. Bursa Efek Indonesia. <https://www.idx.co.id/berita/press-release-detail/?emitenCode=1098>. (Accessed on 26 December 2021)
- Indonesian Stock Exchange. (2021). *Klasifikasi sektor dan sub sektor*. [https://www.idx.co.id/produk/saham/#Klasifikasi Sektor dan Subsektor](https://www.idx.co.id/produk/saham/#Klasifikasi_Sektor_dan_Subsektor). (Accessed on 26 December 2021)
- Irawati, D.E. (2012). Pengaruh struktur modal, pertumbuhan laba, ukuran perusahaan, dan likuiditas terhadap kualitas laba. *Accounting Analysis Journal*, 1(2), 1–6. <https://doi.org/10.15294/aaj.v1i2.572>
- Jacobs, B.W., Kraude, R., & Narayanan, S. (2016). Operational productivity, corporate social performance, financial performance, and risk in manufacturing firms. *Production & Operations Management*, 25(12), 2065–2085. <https://doi.org/10.1111/poms.12596>
- Ji, Y., & Tan, L. (2016). Labor unemployment concern and corporate discretionary disclosure. *Journal of Business Finance and Accounting*, 43(9/10), 1244–1279. <https://doi.org/10.1111/jbfa.12212>
- Jia, J., Munro, L., & Buckby, S. (2016). A finer-grained approach to assessing the “quality” (“quantity” and “richness”) of risk management disclosures. *Managerial Auditing Journal*, 31(8/9), 770–803. <https://doi.org/10.1108/MAJ-12-2014-1135>
- Jian, J., Zhang, Y., Jiang, L., & Su, J. (2020). Coordination of supply chains with competing manufacturers considering fairness concerns. *Complexity*, 2020, 1–15. <https://doi.org/10.1155/2020/4372603>
- Kaltsum, D., & Sebrina, N. (2019). Pengaruh kualitas laba dalam memoderasi hubungan kepemilikan kas dan efisiensi perusahaan

- (Studi empiris pada perusahaan manufaktur yang terdaftar di Bursa Efek Indonesia tahun 2013-2016). *Wahana Riset Akuntansi*, 7(1), 1477-1492. <https://doi.org/10.24036/wra.v7i1.104570>
- Kanghwa, C. (2010). From operational efficiency to financial efficiency. *The Asian Journal on Quality*, 11(2), 137-145. <https://doi.org/10.1108/15982681011075943>
- Kanodia, C., & Sapra, H. (2016). A real effects perspective to accounting measurement and disclosure: Implications and insights for future research. *Journal of Accounting Research*, 54(2), 623-676. <https://doi.org/10.1111/1475-679X.12109>
- Kleffner, A.E., Lee, R.B., & McGannon, B. (2003). The effect of corporate governance on the use of enterprise risk management: Evidence from Canada. *Risk Management and Insurance Review*, 6(1), 53-73. <https://doi.org/10.1111/1098-1616.00020>
- Kothari, S. P., Li, X., & Short, J. E. (2009). The effect of disclosures by management, analysts, and business press on cost of capital, return volatility, and analyst forecasts: A study using content analysis. *Accounting Review*, 84(5), 1639-1670. <https://doi.org/10.2308/accr.2009.84.5.1639>
- Kravet, T., & Muslu, V. (2013). Textual risk disclosures and investors' risk perceptions. *Review of Accounting Studies*, 18(4), 1088-1122. <https://doi.org/10.1007/s11142-013-9228-9>
- Kulkarni, S., Verma, P., & Mukundan, R. (2018). Assessing manufacturing strategy definitions utilising text-mining. *International Journal of Production Research*, 47(14), 4519-4546. <https://doi.org/10.1080/00207543.2018.1512764>
- Kwalomine, A.L. (2017). Pengaruh karakteristik direktur utama terhadap pengungkapan Corporate Social Responsibility (CSR) studi pada perusahaan BUMN. *Jurnal Riset Terapan Akuntansi*, 1(1), 16-25. <https://doi.org/10.5281/zenodo.3840861>
- Lai, S.M., Liu, C.L., & Wang, T. (2014). Increased disclosure and investment efficiency. *Asia-Pacific Journal of Accounting and Economics*, 21(3), 308-327. <https://doi.org/10.1080/16081625.2012.741791>
- Landis, J.R., & Koch, G.G. (1977). An application of hierarchical kappa-type statistics in the assessment of majority agreement among multiple observers. *Biometrics*, 33(2), 363-374. <https://doi.org/10.2307/2529786>
- Lange, D., Boivie, S., & Westphal, J. D. (2014). Predicting organizational identification at the CEO level. *Strategic Management Journal*, 36(8), 1224-1244. <https://doi.org/10.1002/smj.2283>

- Law No 40 of 2007. Limited Liability Company.
- Lee, W. S., Sun, K. A., & Moon, J. (2018). Application of upper echelon theory for corporate social responsibility dimensions: Evidence from the restaurant industry. *Journal of Quality Assurance in Hospitality and Tourism*, 19(3), 387–414. <https://doi.org/10.1080/1528008X.2017.1421492>
- Li, F. (2008). Annual report readability, current earnings, and earnings persistence. *Journal of Accounting and Economics*, 45(2–3), 221–247. <https://doi.org/10.1016/j.jacceco.2008.02.003>
- Li, M., & Roberts, H. (2017). Director and CEO pay reciprocity and CEO board membership. *Journal of Economics and Business*, 94, 54–65. <https://doi.org/10.1016/j.jeconbus.2017.10.002>
- Li, Y., He, J., & Xiao, M. (2019). Risk disclosure in annual reports and corporate investment. *International Review of Economics and Finance*, 63, 138–151. <https://doi.org/10.1016/j.iref.2018.08.021>
- Lin, C., & Tsai, H. L. (2016). Achieving a firm's competitive advantage through dynamic capability. *Baltic Journal of Management*, 11(3), 260–285. <https://doi.org/10.1108/BJM-11-2015-0224>
- Linsley, P. M., & Shrivies, P. J. (2005). Examining risk reporting in UK public companies. *The Journal of Risk Finance*, 6(4), 292–305. <https://doi.org/10.1108/15265940510613633>
- Liu, C., & Jiang, H. (2020). Impact of CEO characteristics on firm performance: Evidence from China listed firms. *Applied Economics Letters*, 27(14), 1–5. <https://doi.org/10.1080/13504851.2019.1607965>
- Lockett, A., Thompson, S., & Morgenstern, U. (2009). The development of the resource-based view of the firm: A critical appraisal. *International Journal of Management Reviews*, 11(1), 9–28. <https://doi.org/10.1111/j.1468-2370.2008.00252.x>
- Loughran, T. (2018). Linguistic tone and the small trader: Measurement issues, regulatory implications, and directions for future research. *Accounting, Organizations and Society*, 68/69, 38–41. <https://doi.org/10.1016/j.aos.2018.03.001>
- Mardini, G. H., & Lahyani, F. E. (2020). Impact of firm performance and corporate governance mechanisms on intellectual capital disclosures in CEO statements. *Journal of Intellectual Capital*, Sep, 1469–1930. <https://doi.org/10.1108/JIC-02-2020-0053>
- Mcchlery, S. (2021). Risk disclosure behaviour: Evidence from the UK extractive industry. *Journal of Applied Accounting Research*, 22(3), 484–506. <https://doi.org/10.1108/JAAR-09-2019-0134>

- Miller, D. (1987). The structural and environmental correlates of business strategy. *Strategic Management Journal*, 8, 55–76. <https://doi.org/10.1002/smj.4250080106>
- Min, H., & Joo, S. J. (2009). Benchmarking third-party logistics providers Using Data Envelopment Analysis: An update. *Benchmarking: An International Journal*, 16(5), 572–587. <https://doi.org/10.1108/14635770910987814>
- Ministry of Industry. (2021). *Unggul di ASEAN, Indonesia fokus tingkatan nilai tambah manufaktur*. <https://kemenperin.go.id/artikel/22780/Unggul-di-ASEAN,-Indonesia-Fokus-Tingkatan-Nilai-Tambah-Manufaktur>. (Accessed on 26 December 2021)
- Moumen, N., Ben Othman, H., & Hussainey, K. (2015). The value relevance of risk disclosure in annual reports: Evidence from MENA emerging markets. *Research in International Business and Finance*, 34(Ribaf 350), 177–204. <https://doi.org/10.1016/j.ribaf.2015.02.004>
- Mun, S., Han, S. H., & Seo, D. (2020). The impact of CEO educational background on corporate cash holdings and value of excess cash. *Pacific Basin Finance Journal*, 61. <https://doi.org/10.1016/j.pacfin.2020.101339>
- Nurchahya, I. A. H. (2021). *Investasi hulu perlu dipacu agar manufaktur tangguh*. *Bisnis Indonesia*. <https://ekonomi.bisnis.com/read/20210106/257/1339176/investasi-hulu-perlu-dipacu-agar-manufaktur-tangguh>. (Accessed on 26 December 2021)
- Oliveira, J., Rodrigues, L. L., & Craig, R. (2011). Risk-related disclosure practices in the annual reports of Portuguese credit institutions: An exploratory study. *Journal of Banking Regulation*, 12(2), 100–118. <https://doi.org/10.1057/jbr.2010.20>
- Pae, S. (2002). Discretionary disclosure, efficiency, and signal informativeness. *Journal of Accounting and Economics*, 33(3), 279–311. [https://doi.org/10.1016/S0165-4101\(02\)00057-5](https://doi.org/10.1016/S0165-4101(02)00057-5)
- Petrou, A. P., & Procopiou, A. (2016). CEO shareholdings and earnings manipulation: A behavioral explanation. *European Management Review*, 13(2), 137–148. <https://doi.org/10.1111/emre.12073>
- Quigley, T. J., & Hambrick, D. C. (2014). Has the “CEO effect” increased in recent decades? A new explanation for great rise in America’s attention to corporate leaders. *Strategic Management*, 36(6), 821–830. <https://doi.org/10.1002/smj.2258>
- Reguera-Alvarado, N., & Bravo-Urquiza, F. (2020). The impact of board diversity and voluntary risk disclosure on financial

- outcomes. A case for the manufacturing industry. *Gender in Management*, 35(5), 445–462. <https://doi.org/10.1108/GM-07-2018-0085>
- Samoilenko, S., & Osei-Bryson, K. M. (2013). Using Data Envelopment Analysis (DEA) for monitoring efficiency-based performance of productivity-driven organizations: Design and implementation of a decision support system. *Omega (United Kingdom)*, 41(1), 131–142. <https://doi.org/10.1016/j.omega.2011.02.010>
- Santia, T. (2021). *Teknologi jadi kunci optimalkan industri manufaktur di tengah pandemi*. Liputan6.Com. [liputan6.com/bisnis/read/4705123/teknologi-jadi-kunci-optimalkan-industri-manufaktur-di-tengah-pandemi](https://liputan6.com/bisnis/read/4705123/teknologi-jadi-kunci-optimalkan-industri-manufaktur-di-tengah-pandemi). (Accessed on 26 December 2021)
- SE OJK No:16/SEOJK.04/2021, (2021). Form and content of the annual report of public company.
- Serfling, M. A. (2014). CEO age and the riskiness of corporate policies. *Journal of Corporate Finance*, 25, 251–273. <https://doi.org/10.1016/j.jcorpfin.2013.12.013>
- Solomon, J.F., Solomon, A., Norton, S.D., & Joseph, N.L. (2000). A conceptual framework for corporate risk disclosure emerging from the agenda for corporate governance reform. *British Accounting Review*, 32(4), 447–478. <https://doi.org/10.1006/bare.2000.0145>
- Souder, D., Simsek, Z., & Johnson, S. G. (2012). The differing effects of agent and founder CEOs on the firm's market expansion. *Strategic Management*, 33(1), 23–41. <https://doi.org/10.1002/smj.944>
- Statistics Indonesia. (2020). *Proporsi nilai tambah sektor industri manufaktur terhadap PDB*. [https://www.bps.go.id/indikator/indikator/view\\_data/0000/data/1214/sdgs\\_9/1](https://www.bps.go.id/indikator/indikator/view_data/0000/data/1214/sdgs_9/1)
- Suryani, A.W., Helliari, C., Carter, A.J., & Medlin, J. (2018). Shunning careers in public accounting firms: The case of Indonesia. *British Accounting Review*, 50(5), 463–480. <https://doi.org/10.1016/j.bar.2018.05.001>
- Ullah, I., Zeb, A., Khan, M.A., & Xiao, W. (2020). Board diversity and investment efficiency: Evidence from China. *Corporate Governance*, 20(6), 1105–1134. <https://doi.org/10.1108/CG-01-2020-0001>
- Unilever. (2019). *Annual Report PT Unilever*.
- Wagner, W. G., & Pfeffer, J. (1984). Organizational demography and turnover in top-management group. *Administrative Science Quarterly*, 29(1), 74–92. <https://doi.org/10.2307/2393081>

- Wang, G., Holmes, R. M., Oh, I. S., & Zhu, W. (2016). Do CEOs matter to firm strategic actions and firm performance? A meta-analytic investigation based on upper echelons theory. *Personnel Psychology*, 69(4), 775–862. <https://doi.org/10.1111/peps.12140>
- Weber, R. P. (1990). *Basic content analysis* (2nd ed.). Sage.
- Williams, D. R. (2013). Human and financial capital as determinants of biopharmaceutical IPO de-listings. *Journal of Business Research*, 66(12), 2612–2618. <https://doi.org/10.1016/j.jbusres.2012.05.019>
- Xie, J. (2015). CEO career concerns and investment efficiency: Evidence from China. *Emerging Markets Review*, 24, 149–159. <https://doi.org/10.1016/j.ememar.2015.06.001>
- Xu, Y., Zhang, L., & Chen, H. (2017). Board age and corporate financial fraud: An interactionist view. *Long Range Planning*, 51(6), 815–830. <https://doi.org/10.1016/j.lrp.2017.08.001>
- Yu, W., Ramanathan, R., Wang, X., & Yang, J. (2018). Operations capability, productivity and business performance: The moderating effect of environmental dynamism. *Industrial Management and Data Systems*, 118(1), 126–143. <https://doi.org/10.1108/IMDS-02-2017-0064>