1. Environmental Disclosure and Efficiency Perpormance of Energy Company Case Study of Indonesia

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Environmental Disclosure and Efficiency Perpormance of Energy Company Case Study of Indonesia.compressed

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Environmental Disclosure and Efficiency Performance of Energy Company: Case Study of Indonesia

Dedi Kusmayadi*, Irman Firmansyah

Faculty of Economic and Business, Siliwangi University, Jawa Barat 46115, Indonesia. *Email: dedikusmayadi@unsil.ac.id

ABSTRACT

This study aims to investigate the efficiency performance of energy companies, especially the environmental disclosure variable as the energy companies' responsibility to the environment, especially in achieving the SDGs. In addition, several other factors were also tested to determine their effect on the level of efficiency. The study was conducted on 42 energy companies in Indonesia for the period 2018 to 2021. Efficiency analysis uses Data Envelopment Analysis with input and output variables from each financial report. Meanwhile, STATA software was used to analyze the regression. The results show that the efficiency level of gas and oil companies is more optimal than other companies. However, coal companies are better at predicting the level of efficiency. This is in line with the huge energy potential in Indonesia that comes from coal. Another finding is that although environmental disclosure has not succeeded in increasing efficiency performance, it can moderate the relationship between size and efficiency level.

Keywords: Efficiency, Gas and Oil, Coal, Environmental Disclosure
JEL Classifications: C12, K32, L25

1. INTRODUCTION

Energy is an important part that is very basic for human life and is needed in achieving economic, social and environmental goals (Hsiao et al., 2019). Samuel et al. (2013) argues that energy is an important resource for society's development and social welfare. In Indonesia, total primary energy production in 2018 consisting of oil, natural gas, coal and renewable energy reached 411.6 MTOE. While the total final energy consumption (without traditional biomass) in 2018 was around 114 MTOE consisting of the transportation sector 40%, then industry 36%, household 16%, commercial and other sectors respectively 6% and 2% (DEN, 2019). A large number of energy needs in Indonesia causes energy industry companies to work hard to provide energy needs because an industrial activity is a pathway to improve people's welfare so that people can live decent lives with higher standards so that industrial development is part of long-term economic development (Hadi et al., 2021).

Therefore, it is important for energy companies to use their resources to the best so that the company has a good efficiency level. A good efficiency level will certainly support the company's operations to run well and perform well.

The negative impact on business activities will hamper achieving the sustainable development goals (SDGs) agenda. Therefore, to participate and contribute to achieving the SDGs agenda, energy companies can implement sustainable strategies and operate according to the SDGs targets. Companies need to ensure that their business operations do not get in the way of this agenda. On the other hand, the company must be responsible for the surrounding environment. After implementing sustainable practices, companies can report their progress and results in working towards sustainability through disclosure in annual reports.

As profit-seeking agents for shareholders, companies must change their business paradigm to the social aspect, namely seeing

companies as global citizens who seek profit and impact the social and environmental fields (Sekarlangit and Wardhani, 2021). To account for this, the company will disclose its environmental responsibility in periodic reports. From the point of view of legitimacy, this disclosure will increase public confidence that the company has a sense of caring for the environment. Ultimately, the company will have an advantage and improve efficiency performance.

Over time, energy companies have faced business challenges since the Covid-19 pandemic. This is because the Covid-19 pandemic is a pandemic that occurs almost evenly throughout the world, and many countries are feeling its negative impacts, and this is one of the worst health crises in the last century (Indupurnahayu et al., 2021). Concerns arise if the energy supply does not meet the needs of a country because it will reduce the country's economic growth. Some of the conditions common in developing countries are energy supply that does not meet demand, dependence on foreign countries, inefficient use of energy, and frequent power outages (Alter and Syed, 2011; Tang, 2009; Khan and Ahmad, 2008). Therefore, energy companies must maintain their efficiency level even when conditions are out of control.

This study aims to measure the efficiency of energy companies in Indonesia, including the impact caused by the Covid-19 Pandemic. In addition, it is knowing the determination of factors that can affect the efficiency of energy companies, especially the effects of environmental disclosures.

Empirical studies have found that the company's internal resources are believed to impact company performance through financial management, management, and accounting (Barney, 2001). So that several factors examined by previous researchers were proven to have an impact on company performance, namely Leverage (Qureshi, 2009; Fareed et al., 2016; Matar and Eneizan, 2018; Batchimeg, 2017; Dasuki, 2016), Liquidity (Matar and Eneizan, 2018; Batchimeg, 2017), company size (Yazdanfar, 2013; Fareed et al., 2016; Matar and Eneizan, 2018) and company age (Yazdanfar, 2013; Fareed et al., 2016). In addition, several empirical studies have found that environmental disclosure is important in holding a business accountable for achieving SGDs. Therefore, a lot of research links environmental disclosure with company efficiency performance (Rahim, 2021; Deswanto and Siregar, 2018; Nor et al., 2016). In this study, environmental disclosure is used as a moderating variable to be tested for its role in increasing the efficiency of energy companies in Indonesia. So that this research will find important novelties in the development of science.

2. LITERATURE REVIEW

In simple terms, Norman (1997) states that efficiency can mean no waste. Efficiency is the ratio between output and input related to achieving maximum output with several inputs. This means, if the output ratio is greater than the input, the efficiency is said to be higher, so that efficiency can be concluded, namely the use of the best input to produce maximum output. Meanwhile, measuring a company's efficiency level based on an accounting point of view is an assessment using available resources through financial ratios, so it is often called financial analysis. Usually the level of company efficiency is the ability to produce output through inputs as measured by various financial ratios. In Fenyves and Tarnoczi's (2020) research the input variables used by companies to measure efficiency consist of tangible assets, current assets, non-current liabilities, current liabilities, material expenses, personnel expenses, and depreciation. While the output variable consists of net sales revenues, operating profit or loss, earnings after taxes. Some of these variables are then analyzed to determine the efficiency level.

However, there is a shift in business focus at this time. Companies not only think about performance but must also consider the negative impact of their business activities. Management must allocate funds to carry out activities that support the achievement of sustainable development goals. One of them is concern for the environment. In showing its contribution, management will disclose it through environmental disclosures. Hummel and Szekely (2021) stated that reporting on SDGs increases quality over time but is still weak in disclosing quantitative information.

Bebbington and Unerman (2018) highlight the possibility that companies are using SDGs to disguise their business by using sustainability rhetoric regarding SDGs. Therefore, the motive for environmental disclosure can increase profits for the company. These advantages will increase efficiency performance. So high environmental disclosure can provide a moderating effect for many variables, especially in increasing efficiency performance.

One of the factors that is thought to influence efficiency performance is leverage. Leverage, or the debt to equity ratio (DER), is a fundamental measure of company finance, which can show the company's financial strength. This ratio is between equity and debt, where debt includes long-term, short-term and current liabilities (Walsh, 2003).

The energy company's funding policy, which is reflected in the DER ratio, greatly influences the efficiency performance achieved by the company. The higher the DER will affect the amount of profit achieved by the company. High profits certainly support the achievement of a good level of efficiency. Suppose the cost of debt reflected in the cost of borrowing is greater than the cost of own capital. In that case, the average cost of capital (weighted average cost of capital) will be greater so that performance will be smaller, and vice versa (Brigham, 1983).

This high ratio indicates that the company will have real problems in the long term, one of which is the possibility of bankruptcy. The greater the debt, the greater the risk borne, although in a situation where the company can very well manage its debt, the existence of debt will provide a good opportunity for the company to increase its profits.

The higher the DER indicates the greater the trust from outsiders, this is very possible to improve efficiency performance, because with large capital, the opportunity to run company operations flexibly also increases, so that the output produced by the company must be even better. Thus, it is expected that DER will positively

influence the efficiency level, especially in energy companies. The results of research by Qureshi (2009), Fareed et al. (2016), Matar and Eneizan (2018), Batchimeg (2017), and Dasuki (2016) show that financial leverage as measured by the DER ratio is positively related to performance. Meanwhile, research by Campbell (2002) and Miyajima et al. (2003) shows the opposite relationship.

Furthermore, liquidity is another financial ratio that plays a central role in running the company, especially in asset management. Liquid management aims to maximize profits from its operations while meeting its short-term obligations and future operational costs (Panigrahi, 2014). So the company must resolve all the risks, including investment (Eljelly, 2004). Excessive investment will reduce profitability (Fama and Jensen, 1983). Literature studies on the relationship between liquidity and company efficiency performance were carried out by Ghosh and Maji (2003), Muhammad et al. (2012), Ehiedu (2014), and Rehman et al. (2015). They found a positive relationship between liquidity and performance. However, many studies have shown the opposite result (Saldanli, 2012; Narware, 2004; Lyroudi et al, 1999; Eljelly, 2004; Bardia, 2004).

Firm size is a scale, which can be classified in various ways. One of them is seen from the total assets. A company with large assets can more easily utilize its resources to produce maximum output, making it easier to earn profits. Empirical studies prove that firm size has a role in increasing the company's financial performance (Yazdanfar, 2013; Fareed et al., 2016; Matar and Eneizan, 2018; Alper and Anbar, 2011; Abel and Roux, 2016; Hidayat and Firmansyah, 2017; Almajali et al., 2012; Menicucci and Paolucci, 2016; Short, 1979; Mehari and Aemiro, 2013; Rashid and Kemal, 2018).

In addition, energy companies with a long life will have knowledge and experience in running company operations to be more experienced in managing company resources. This has been proven by several studies, namely Yazdanfar (2013), Fareed et al. (2016), Batra, (1999), Lumpkin and Des (1999), Almajali et al. (2012), Alomari and Azzam (2017), Batrinca and Burca (2014) and Kaya (2015) which show that age has a role in improving company performance.

Meanwhile, in the course of its business, energy companies began to be disrupted since early 2020 during the COVID-19 pandemic. Covid-19 is an infectious disease caused by a corona virus that causes mild to moderate respiratory distress. WHO stated that the COVID-19 pandemic began on January 30, 2020 and was immediately followed by countries that decided to impose a lockdown immediately and prohibit business activities and social gatherings. Meanwhile, President Joko Widodo reported that he first found two cases of COVID-19 infection in Indonesia on March 2, 2020 (Djalante et al., 2020).

Due to this incident, energy companies in Indonesia received the impact of this pandemic. The reason is that Indonesia is one of the most populous countries in the world, so it is estimated that it will receive a bigger impact than other countries if the pandemic occurs over a long period (ADB, 2020).

3. RESEARCH METHOD

This study uses a population of energy companies in Indonesia that are listed on the Indonesia Stock Exchange from 2018 to 2021. Collection of population taken in that period with consideration due to limitations of researchers in obtaining data. A purposive sampling method was used from the entire population to select the sample to be used in this study. 42 energy companies used gas, oil, coal, and other companies as research samples.

This study uses 3 variables. The first is the dependent variable. In this study the dependent variable is the company's efficiency which is calculated using Data Envelopment Analysis (DEA), consisting of input and output variables. The input variables are tangible assets, current assets, non-current liabilities, current liabilities, material expenses, personnel expenses, and depreciation. While the output variables consist of net sales revenues, operating profit or loss, and earnings after taxes. Second, the independent variable consists of leverage proxied by the debt to equity ratio (DER). Liquidity as measured by the current ratio. Size proxied by total assets. The age of the company proxied by the long-standing of the company. This research also adds the types of energy companies, namely gas and oil companies to coal companies as independent variables. The third is the moderating variable. In this study, environmental disclosure as a moderating variable is measured by the percentage of disclosure based on the Global Reporting Initiative (GRI).

Furthermore, this study will analyze the data in stages according to research needs. The first stage is efficiency analysis. This analysis is used to find the efficiency level of energy companies in Indonesia. Analysis using Data Envelopment Analysis (DEA). Charnes et al. (1978) developed the DEA model with the constant Return to Scale (CRS) method. Banker, Charnes and Cooper developed them with the variable Return to Scale (VRS) method, finally known as CCR (Charnes-Cooper-Rhodes) and BCC (Banker-Charnes-Cooper). DEA is a procedure specially designed to measure relative efficiency using multiple inputs and multiple outputs, where combining inputs and outputs is not possible. Relative efficiency is the efficiency of a company compared to other companies in a sample using the same type of input and output.

The value of *hs*, where *hs* is the efficiency value for each period, will be determined through Data Envelopment Analysis (DEA). The value of hs, the total of the multiplications between the weights of the output *i* and the number of outputs *i* in period *s*, is maximized using data envelopment analysis.

$$h_s = \frac{\sum_{i=1}^{m} u_i y_{is}}{\sum_{j=1}^{n} v_j x_{js}}$$

where:

hs = firm s efficiency, m = observed firm s output, n = input of firm s observed, yis = totaoutput i produced by firm s, xjs = number of input j used by firm s,

ui = weight of output i produced by firm s, vj = weight of input j provided by firm s, and i isalculated from 1 to m and j is calculated from 1 to n.

One input and one output variable are used in the equation above. After that, the efficiency ratio (hs) was optimized with the following restrictions:

$$\text{Maximize } h_s = \frac{\sum_{i=1}^{m} u_i y_{is}}{\sum_{j=1}^{n} v_j x_{js}} \cdot \quad \leq 1; r = 1\ldots\ldots, N.$$

Where u_i and $vj \geq 0$

The number of companies in the sample is denoted by N in the equation, and the type of company sampled in the study is denoted by r. While the second inequality has a non-negative (positive) weight, the first indicates that the ratio for other economic activity units is not greater than 1. The ratio value ranges from 0 to 1. A ratio near to 1 or 100% suggests a company is efficient; on the other side, if it is close to 0, it shows the organization's efficiency is declining. To analyze this technical efficiency, MaxDea ver 6.6 software is used.

The next stage is regression analysis. This analysis was conducted to test the dependence of the independent variable on the dependent variable, as well as to test the moderating effect of environmental disclosure. The regression analysis results are in the form of regression coefficients for each independent variable. This coefficient is obtained by predicting the value of the dependent variable with an equation. Analysis using STATA software.

The basic model can be formulated as follows:

$$\text{Eff} = a + b_1 \text{LEV}_{it} + b_2 \text{LIQ}_{it} + b_3 \text{SIZE}_{it} + b_4 \text{AGE}_{it} + b_5 \text{Gas\&Oil}_{it} + b_6 \text{Coal}_{it} \ldots. \quad (1)$$

$$\text{Eff} = a + b_1 \text{LEV}_{it} + b_2 \text{LIQ}_{it} + b_3 \text{SIZE}_{it} + b_4 \text{AGE}_{it} + b_5 \text{Gas\&Oil}_{it} + b_6 \text{Coal}_{it} + b_7 \text{ENV}_{it} \ldots. \quad (2)$$

$$\text{Eff} = a + b_1 \text{LEV}_{it} + b_2 \text{LIQ}_{it} + b_3 \text{SIZE}_{it} + b_4 \text{AGE}_{it} + b_5 \text{Gas\&Oil}_{it} + b_6 \text{Coal}_{it} + b_7 \text{ENV}_{it} + b_8 \text{LEV\_ENV}_{it} + b_9 \text{LIQ\_ENV}_{it} + b_{10} \text{SIZE\_ENV}_{it} + b_{11} \text{AGE\_ENV}_{it} \ldots. \quad (3)$$

Where: EFF is Efficiency with the results of DEA analysis, LEV is leverage (Debt to Equity Ratio), LIQ is Liquidity (current ratio), SIZE is company Size, AGE is company Age, Gas&Oil is Gas and Oil Company, Coal is coal company, ENV is Environmental disclosure.

4. RESULTS AND DISCUSSION

4.1. Descriptive Analysis
The energy company data collected is 42 companies from 2018 to 2021 so the total data analyzed is 168, consisting of efficiency scores, leverage, liquidity, size, age, and environmental disclosure. The types of energy companies consisting of gas and oil companies and coal companies are nominal scale so they are not included in

Table 1. The table also shows the minimum, maximum, mean and standard deviation values.

4.2. Pearson Correlation
Table 2 shows the correlation between variables which shows the relationship of each. There is a positive relationship between efficiency and leverage, liquidity, and coal companies. Meanwhile, efficiency is negatively related to size, age, gas and oil companies, and environmental disclosure.

4.3. Efficiency Level of Energy Companies in Indonesia
The efficiency level of energy companies in Indonesia is measured using data envelopment analysis (DEA) using several inputs and outputs. Table 3 shows the efficiency level of energy companies for the last four years (2018-2021).

For more details, the percentage of efficiency level in general for constant, increasing, or decreasing conditions is presented in Figure 1.

Based on Figure 1, it is known that only 22% of energy companies in Indonesia will achieve optimal efficiency from 2018 to 2021. Meanwhile, 78% are not yet efficient, 44% are experiencing increased efficiency, and 34% are experiencing a decreasing efficiency phase.

From Figure 2, it is known that the highest level of efficiency occurred in 2018, which was 78.74%, then continued to decline until 2020 reaching 65.25%. It will increase again in 2021, which is 69.07%.

Table 1: Descriptive statistic

Variable	Obs.	Mean	SD	Min	Max
Eff	168	0.805	0.196	0.329	1.000
Lev	168	200.694	429.954	5.050	4308.640
Liq	168	184.747	150.175	10.580	1007.430
Size	168	15.474	1.517	12.870	18.550
Age	168	29.857	12.134	7.000	57.000
Env	168	0.053	0.041	0.010	0.259

Figure 1: Constant, increasing or decreasing percentage of energy companies in Indonesia
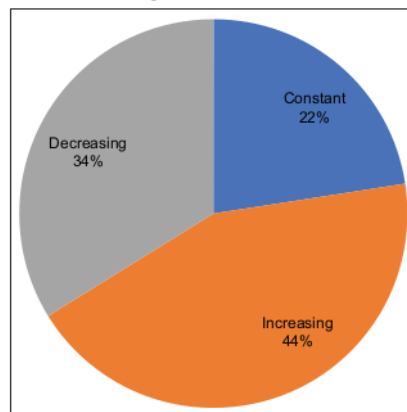
Table 2: Pearson correlation

Variable	Eff	Lev	Liq	Size	Age	Gas&Oil	Coal	Env
Eff	1.000							
Lev	0.0251	1.0000						
Liq	0.1465	−0.1951	1.0000					
Size	−0.2609	0.0011	−0.0323	1.0000				
Age	−0.0766	0.1044	−0.0426	0.2930	1.0000			
Gas&Oil	−0.1234	0.1093	0.0222	0.0544	0.3485	1.0000		
Coal	0.3686	0.0698	0.2126	0.1667	−0.1884	−0.4167	1.0000	
Env	−0.0079	−0.0884	0.0343	0.2703	0.1343	−0.0145	0.0449	1.0000

Table 3: The score of energy company efficiency from 2018 to 2021

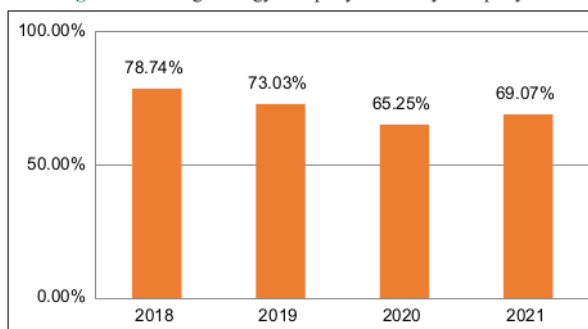| Company Names	Efficiency level			
	2018	2019	2020	2021
Bayan Resource	1.000	0.788	0.979	1.000
Exploitasi Energi Indonesia	1.000	0.474	0.583	0.532
Darma Henwa	0.736	0.531	0.454	0.485
Delta Dunia Makmur	0.651	0.644	0.672	0.503
Dian Swasastika Sentosa	1.000	0.625	0.485	0.640
Elnusa	1.000	0.874	0.730	0.816
Eterindo Wahanatama	0.276	0.751	1.000	1.000
Golden Mines	0.911	0.856	0.774	1.000
Humpuss Intermoda Transportasi	0.672	0.744	0.690	0.565
Harum Energy	0.994	1.000	0.884	0.604
Indika Energy	0.812	0.751	0.548	0.603
Indo Tambangraya Megah	1.000	1.000	0.841	1.000
Sky Energi Indonesia	0.910	0.870	0.449	0.289
Resource Alam Indonesia	0.589	0.991	0.813	1.000
Logindo Samudra Makmur	0.489	0.406	0.520	0.512
Mitrabahtera Segara Sejati	1.000	0.770	0.366	1.000
Medco Energi Internasional	0.293	0.350	0.231	0.325
Samindo Resources	1.000	1.000	1.000	1.000
Perusahaan Gas Negara	0.542	0.585	0.500	0.578
Pelita Samudera Shipping	0.634	0.761	0.635	0.683
Bukit Asam	0.652	0.676	0.668	0.601
Indo Straits	0.762	0.697	0.631	0.651
Petrosea	0.575	0.625	0.499	0.558
Rukun Raharja	0.819	0.730	0.647	0.649
Soechi Lines	0.518	0.553	0.438	0.454
Tbs Energi Utama	0.797	1.000	0.838	0.656
Wintermar Offshore Marine	0.916	0.466	0.344	0.374
Apexindo Pratama Duta	1.000	0.570	1.000	0.475
Atlas Resources	0.460	0.331	0.273	0.485
Astrindo Nusantara Infrastruktur	0.135	0.172	0.225	0.172
Borneo Olah Sarana Sukses	0.612	0.340	0.675	1.000
Baramulti Suksessarana	1.000	1.000	0.915	1.000
Bumi Resources	0.670	0.662	0.750	0.567
Dwi Guna Laksana	1.000	1.000	1.000	1.000
Energi Mega Persada	0.537	0.765	0.703	0.706
Alfa Energi Investama	1.000	1.000	1.000	1.000
Mitrabara Adiperdana	1.000	0.965	0.802	1.000
Capitalinc Investment	0.461	0.943	1.000	1.000
Perdana Karya Perkasa	0.773	1.000	1.000	0.417
Rig Tenders Indonesia	0.615	0.953	1.000	0.731
Sillo Maritime Perdana	1.000	0.780	0.623	0.672
Golden Eagle Energy	1.000	0.663	0.555	1.000
Super Energy	1.000	0.340	0.499	0.570
Pelayaran Tamarin Samudra	0.673	0.667	0.544	0.413
Transcoal Pacipic	0.745	0.671	0.613	0.622
Trans Power Marine	0.713	0.715	0.612	0.920
Adaro Energy	0.818	0.569	0.494	0.579
Akr Corporindo	0.896	0.674	0.759	0.744
Ratu Prabu Energi	0.241	1.000	0.209	0.139
Pelayaran Nasional Bina Buana Raya	0.727	0.634	0.414	0.327
Buana Lintas Lautan	0.403	0.320	0.482	0.611

Figure 2: Average energy company efficiency rate per year

Figure 3: Efficiency level per type of business
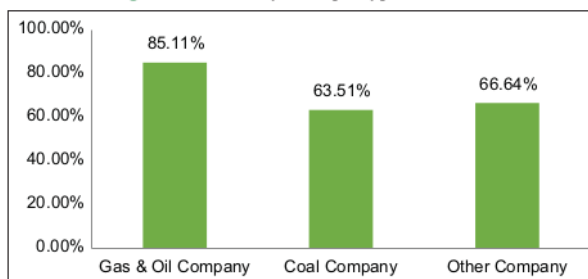
Of all the energy companies that were sampled, we divided them into gas and oil companies, coal companies, and other types of energy companies. To see the average level of efficiency per type of company, it can be seen in Figure 3.

Figure 3 illustrates that oil and gas companies have the highest efficiency, 85.11%. Meanwhile, coal companies accounted for 63.51%.

4.4. Regression Analysis

This analysis is intended to determine the factors that influence the level of efficiency of energy companies in Indonesia, as well as to determine whether environmental disclosure is a variable that determines the increase in efficiency performance (Tables 4-6).

Table 4 shows that leverage, liquidity, and age are not variables that affect the efficiency level of energy companies in Indonesia. All three have not been able to show a significant effect. The gas and oil companies category is also not a company that can predict the efficiency level of energy companies in Indonesia. In contrast to coal companies that have a positive influence.

Table 4: Output regression analysis model 1

Number of Obs. = 148
F (6, 161) = 9.37
Prob>F = 0.000
R-Squared=0.2589
Adj R-Squared=0.2312
Root MSE=0.17249

Eff	Coefficient	SE	t	p>t	(95% conf. interval)	
Lev	−7.92e-06	0.000032	−0.24	0.809	−0.000072	0.000056
Liq	0.0000458	0.000094	0.48	0.630	−0.000141	0.000233
Size	−.0481285	0.009541	−5.04	0.000	−0.066970	−0.029286
Age	0.0016827	0.001241	1.36	0.177	−0.000769	0.004134
Gas&Oil	0.0259884	0.036905	0.70	0.482	−0.046891	0.098868
Coal	0.1913108	0.033213	5.76	0.000	0.125721	0.256900
Cons	1.41821	0.141048	10.05	0.000	1.139667	1.696754

Model 1 without including environmental disclosure variables

Table 5: Output regression analysis model 2

Number of Obs. = 168
F (7, 160) = 8.13
Prob>F = 0.000
R-Squared=0.2623
Adj R-Squared=0.2300
Root MSE=0.17263

Eff	Coefficient	Std err	t	p>t	(95% conf. interval)	
Lev	−5.51e-06	0.000032	−0.17	0.867	−0.000070	0.00005
Liq	0.0000433	0.000095	0.46	0.649	−0.000144	0.00023
Size	−0.0500928	0.009819	−5.10	0.000	−0.069485	−0.03070
Age	0.0015943	0.001246	1.28	0.203	−0.000868	0.00405
Gas&Oil	0.027423	0.036973	0.74	0.459	−0.045595	0.10044
Coal	0.1913472	0.033240	5.76	0.000	0.125700	0.25699
Env	0.0292546	0.034096	0.86	0.392	−0.038082	0.09659
Cons	1.435288	0.142560	10.07	0.000	1.153745	1.71683

Model 2 includes environmental disclosure variables

Table 6: Output regression analysis Model 3

Number of Obs. = 148
F (11, 156) = 6.53
Prob>F = 0.000
R-Squared=0.3153
Adj R-Squared=0.2679
Root MSE=0.16843

Eff	Coefficient	SE	t	p>t	(95% conf. interval)	
Lev	−0.000043	0.000054	−0.79	0.432	−0.000150	0.000064
Liq	3.66e-06	0.000196	0.02	0.985	−0.000383	0.000390
Size	−0.0830456	0.015088	−5.50	0.000	−0.112850	−0.053240
Age	0.001521	0.001983	0.77	0.444	−0.002397	0.005439
Gas&Oil	0.012225	0.036895	0.33	0.741	−0.060654	0.085104
Coal	0.1987046	0.032701	6.08	0.000	0.134110	0.263298
Env	−1.159167	0.368326	−3.15	0.002	−1.886719	−0.431615
Lev_Env	0.0001011	0.000142	0.71	0.479	−0.000180	0.000382
Liq_Env	0.0001337	0.000323	0.41	0.679	−0.000504	0.000771
Size_Env	0.0705358	0.024847	2.84	0.005	0.021455	0.119616
Age_Env	−0.0003875	0.002703	−0.14	0.886	−0.005727	0.004952
Cons	1.986782	0.217380	9.14	0.000	1.557394	2.416170

Model 3 includes environmental disclosure variables and moderating variables

Meanwhile, the company's size, which is proxied by total assets, is one of the variables that determine the level of company efficiency even though in a negative direction. This means that the greater the assets owned by the energy company, the lower the efficiency level. Companies with large assets should be able to optimize their financial resources to be managed as well as possible to produce optimal output. However, in contrast to energy companies in Indonesia, large companies find it more difficult to manage their funds. Too large of assets owned is actually difficult to manage, so it does not produce optimal benefits. In addition, the COVID-19 pandemic that has occurred over the past two years has disrupted the business activities of energy companies, resulting in reduced efficiency.

Of the two types of energy company categories studied, namely gas and oil companies, and coal companies, the results found that coal companies positively influence efficiency (see models 1 and 2). This means that coal companies are more capable of increasing their efficiency than other energy companies such as oil and gas companies. This is in line with conditions in Indonesia where coal companies have great potential to generate profits. The Indonesian government wants that there is a reduction in greenhouse gas emissions, especially from the energy sector. As much as 35% of the need for CO_2 emissions comes from electricity sourced from coal. In line with that, the Indonesian government wants in 2021 an increase in coal production of up to 635 million tons. This is a signal of government support for the progress of energy companies in the coal sector in Indonesia. The huge market potential for coal companies will encourage companies to obtain high revenues and profits. This will make coal companies in Indonesia more efficient, especially in utilizing their sources of funds to be managed for big profits.

Furthermore, to determine the effect of environmental disclosure on efficiency, model 2 shows that environmental disclosure does not have a significant effect. However, in model 3, after adding a new variable, namely environmental disclosure, which is used as a moderating variable for the four independent variables, the results show that size is the variable that is disturbed by environmental disclosure in a positive direction. This means that environmental disclosure helps increase efficiency, but only in large companies. Initially, environmental disclosures by management did not significantly increase efficiency. It is possible that the disclosure is not intended for that, but to show that the company cares about achieving the SDGs. However, these disclosures have a good effect on energy companies that have many assets.

5. CONCLUSION

Energy needs in Indonesia continue to grow, especially energy sourced from coal. For this reason, energy companies must be able to manage their financial and non-financial resources to achieve an optimal level of efficiency. If the company can achieve optimal efficiency then accelerate to improve its performance. However, company management must divide its business focus so that it does not only aim to achieve profits but also contribute to the surrounding environment. Concern for the environment must be reported in the annual report through disclosure.

Based on the test results, environmental disclosure does not affect the efficiency performance of energy companies. However, it also strengthens the relationship between size and efficiency. This means that efficiency can increase with environmental disclosures made by companies, especially in large-scale companies.

Another finding is related to achieving this efficiency. Energy companies experienced a decrease in efficiency from 2018 to 2020, and will increase again in 2021. The Covid-19 pandemic that has occurred since early 2020 in Indonesia correlates with a decrease in efficiency. Of the two types of energy companies specifically analyzed, gas and oil companies have higher efficiency than coal companies.

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