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The Impact of the Indonesian Carbon Tax Legislation on Energy Company Stock Prices

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Abstract

This study aims to analyze the impact of Law No. 7 of 2021, particularly carbon tax regulations in Indonesia, on the share price of energy companies. The implementation of Law No. 7 of 2021 concerning carbon taxes in Indonesia is a strategic measure to control carbon emissions and favor the development of new and renewable energy. The implementation of this law is expected to impact the energy sector, especially the coal sector, which is a major contributor to carbon emissions. This study aims to analyze the impact of the enactment and the postponement of the carbon tax regulations on the stock prices of energy companies. This study uses data from energy companies listed on the Indonesia Stock Exchange (IDX) with a time span of five days before and after carbon tax legislation, five days before and after the first postponement of carbon tax implementation, and five days before and after the second postponement of the implementation. Data analysis used descriptive statistical tests, and Wilcoxon signed rank test. The results showed that the establishment and postponement of the Indonesian carbon tax affected the stock prices of energy companies in Indonesia. There were changes in stock prices before and after the establishment and postponements of the Indonesian carbon tax regulations.

Keywords: Carbon Tax, Coal Company, Share Prices, Indonesia

1. INTRODUCTION

Mitigating climate change is increasingly important for Indonesia, an archipelagic country with thousands of islands. According to the Meteorology, Climatology, and Geophysics Agency, Indonesian small islands are at risk of disappearing due to the consistent rise of sea level, between 0.8 and 1.2 centimeters per year (Bappenas, 2021). The Indonesian government has proposed implementing carbon taxes, regulated by the Indonesian Tax Law No. 11/2021 (GoI, 2021). However, the implementation has been postponed twice by the Minister of Finance for unclear reasons (Kemenkeu, 2022). According to Law No. 11/2021, the implementation of the Indonesian carbon tax was originally scheduled for April 1, 2022. The law stated that the carbon tax would initially target coal power producers. However, the implementation was postponed to July 1, 2022, and then canceled without any further rescheduling. These postponements might affect the national commitment to reduce greenhouse gas emissions.

Based on the Indonesian Nationally Determined Contribution (2021), Indonesia aims to reduce greenhouse gas emissions by up to 41%, with international assistance, by 2030. However, according to the Centre for Research on Energy and Clean Air (CREA) and Global Energy Monitor (GEM) report (2023), Indonesian captive coal power capacity has increased nearly eight times more in 2023 than in the previous decade. This situation may become contra-productive with national initiatives for decarbonization. Based on the recent development in the coal power industry in Indonesia, this research aims to investigate the impact of Indonesian carbon tax legislation and its postponed implementations on the stock prices of coal producers. This event study will examine any differences in coal power stock prices associated with carbon tax legislation. The observation will focus on the five days before and after the legislation and the five days before and after each postponement.

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2. LITERATURE REVIEW

2.1 Factors influencing the stock price

The stocks listed on the Indonesia Stock Exchange are classified into eleven categories: energy, raw materials, industry, primary consumer goods, non-primary consumer goods, health, financial, property and real estate, technology, infrastructure, transportation, and logistics. According to Singh (2010), stock prices can be influenced by numerous factors related to the company, sector and the environment in which a firm conducts its business. Below are several factors that can affect stock price (Zulfikar, 2016):

1) Internal Factors
    a. Marketing, production and sales-related announcements, including price changes, production reports, new product recalls and sales reports.
    b. Financing announcements regarding equity and liabilities.
    c. Management board announcements. These may include changes to the organizational structure.
    d. Diversified takeover announcements such as takeover, acquisition, and merger reports.
    e. Investment announcements.
    f. Employment announcements.
    g. Announcement of the company's financial statements

2) External Factors
    a. Government announcements related to inflation, interest rate changes, exchange rates, among others.
    b. Legal announcements.
    c. Securities industry announcements.
    d. Exchange rate fluctuations and political issues.
    e. Issues that arise both from within and outside the country.

According to Sunde and Sanderson (2009), stock price can be influenced by numerous factors:

1. Company's earnings. Stocks with strong growth potential are in high demand, causing their prices to rise rapidly. Expected dividend income can also attract stock investment, especially if the yield exceeds returns from other investment options.
2. Management. A company's management can make decisions that affect the risks and returns associated with the stock.
3. Lawsuits. Legal issues can result in fines and liabilities, leading to a decrease in the share price owing to an increased risk for investors.
4. Mergers and takeovers. Market perception of a merger or takeover can impact stock prices.
5. Market liquidity and stability. In less liquid market, share price may fall, particularly when there is high supply and low demand.
6. Availability of substitute securities, such as loan stock, unit trusts and treasury bills.
7. Government policies. Changes in tax regulations, government spending, monetary and industrial policy can have an effect on stocks.
8. Macroeconomic fundamentals such as interest rates, inflation and exchange rates.
9. Investor sentiment. Stock price movements can be influenced by investor perceptions. The level of investor confidence in a country's economic policies can affect stock price.
10. Analyst reports. Recommendations regarding "buy" or "sell" decisions can affect stock price.

2.2 Investor's reaction

Investors are motivated to invest by the potential for an increase in value (capital gain) or through dividend distribution (Hartono, 2017). Information can influence investors' buying, holding, or selling their shares. Stock price movement may indicate investor's reactions toward particular news, including carbon tax legislation.

2.3 Carbon taxes

The tenth annual report of the "Carbon Emissions Gap Report 2019" from the United Nations Environment Programme (UNEP) indicates that global carbon emissions need to be reduced by 7.6% annually between 2020 and 2030 (Christiansen et al., 2018). Urgent policy formulation is necessary to mitigate the growth of carbon emissions. Many countries have taken significant steps to address climate change by reducing the use of traditional fossil energy and increasing the utilization of renewable energy, including the European Union and India (Bridge et al., 2013; Ortega-Ruiz et al., 2020).

A carbon tax is imposed on goods or activities based on their emissions. Under this policy, businesses and individuals subject to the carbon tax are incentivized to reduce their emissions to lower their tax liabilities. Implementing a carbon tax is in line with Pigovian theorem which suggests that negative externalities (i.e., pollution) can be corrected by imposing tax equivalent to the externalized costs (Metcalf, 2021). In this regard, a carbon tax can serve as a new source of government revenue that can be allocated to public spending or utilized to reduce other types of taxes (Partnership for Market Readiness, 2017). According to the European Environment Agency (EEA), the implementation of "green taxes" by several European countries over the past ten years has yielded positive results. In particular, the carbon tax implemented in Norway reportedly resulted in a 3-4% reduction in CO2 emissions.

Indonesia is committed to further reducing emissions to achieve Net Zero Emissions by 2060. One of the measures being taken is the implementation of a Carbon Tax, which is regulated by Law Number 7 of 2021. According to this law, starting April 1, 2022, coal-fired power facilities will be subject to a carbon tax. However, this carbon tax implementation underwent two postponements since the planned schedule. The first postponement occurred when the implementation was rescheduled to July 1, 2022. Eventually, this schedule was also canceled.

2.4 Carbon pricing implementation in Australia

Australia is a country that has implemented a carbon tax but eventually abolished it. Australia introduced carbon pricing in the Clean Energy Act in 2011 and finally implemented it in 2012 at AUD$23 per tonne of carbon dioxide gas. Revenue from the carbon tax was used to provide incentives such as income tax deductions, increased retirement benefits, and social welfare. However, the policy was repealed on July 17, 2014, due to a lack of political and public support. The new elected prime minister fulfilled his election promise to repeal the carbon tax. According to the Australian government, each household might benefit from this abolishment due to a decrease in gas prices by 7 percent and electricity by 9 percent.

3. METHOD

This study employs quantitative methods to examine the impact of carbon taxation on the stock price of coal companies. The data utilized in this study are secondary data sourced from the Indonesia Stock Exchange and Yahoo Finance. The specific data used in this study includes:

1. The dates of the carbon tax legislation by Law No. 7 of 2021, including the first and second postponements.
2. List of coal sector companies listed on the Indonesia Stock Exchange.
3. Stock price closing data.

This study uses an 11-day observation time (event window) around the announcement date to accurately capture the market reaction. This includes 5 days before the announcement date (t-5), the announcement day (t), and 5 days after the announcement date (t+5). The event window for this study spans from October 22, 2021, to November 05, 2021, for the carbon tax legislation, from March 25, 2022, to April 08, 2022, for the first carbon tax delay, and from June 24, 2022, to July 08, 2022, for the second carbon tax delay. This approach ensures that our research results are not influenced by other events, thus leading to accurate conclusions.

3.1 Population and research samples

This research focused on studying the stock prices of Indonesian coal power companies listed on the Indonesia Stock Exchange from 2021 to 2022. The sample criteria for this study are coal power companies that are active during the observation period, which is eleven days around the dates of legislation and postponements. This study used 33 samples of companies in the coal sector. The observation period lasted for 11 days, including 5 days before the event date, the event date itself, and 5 days after the event date.

3.2 Data Analysis

The data was analyzed using a descriptive statistic test, and Wilcoxon signed rank test using SPSS version 21.

1. Descriptive Statistic Test

The descriptive test will provide maximum, minimum, average, and standard deviation values.

2. Wilcoxon Signed Rank Test

The Wilcoxon test compares stock prices before and after a specific event. This non-parametric test is used to analyze two dependent or correlated samples. The sign test looks at the direction of the difference in pairs, while the Wilcoxon Test considers both the direction and the magnitude of the difference in the paired data from a single sample. The decision criteria for the Wilcoxon signed rank test are as follows: If the achieved significance value is greater than 0.05, it indicates that there is no significant difference. If the obtained significance value is less than or equal to 0.05, it suggests the presence of a significant difference.

$$Z = \frac{T - [\frac{1}{4N(N+1)}]}{\sqrt{\frac{1}{24N(N+1)(2N+1)}}}$$

Description:
N = Total Data
T = Total rank of the difference value of positive data or negative data

4. RESULT AND DISCUSSION

Based on carbon tax legislation on October 29, 2021, the carbon tax was planned to be implemented in April 2022, but in reality, the carbon tax policy was postponed and planned to take effect in July 2022. The carbon tax policy was again postponed for the second time. The following is an analysis of these three events:

1) At the time of Carbon Tax Legislation

One hundred and sixty-five samples are used in this study. The results show that the average share price of companies in the coal sector before the legislation of the Indonesian carbon tax was 2,637.2082. Dian Swastika Sentosa (DSSA) has the highest share price of 33,300. The lowest share price is 50. Four companies have the lowest share price: Astrindo Nusantara Infrastruktur (BIPI), Exploitasi Energi Indonesia (CNKO), Darma Henwa (DEWA), SMR Utama (SMRU). The standard deviation before the legislation of Law No. 7 of 2021 on Indonesian Carbon Tax showed a value of 6,503.95214 which is higher than the average value. This means that the data is heterogeneous because the stock prices differ considerably from one to another.

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Before Carbon Tax Legislation	165	50	33,300	2,637.2082	6,503.95214
After Carbon Tax Legislation	165	50	32,050	2,578.5279	6,379.20528
Valid N (listwise)	165				

After the legislation of Law No. 7 of 2021, the highest stock price is 32,050, including the shares of Dian Swastika Sentosa (DSSA) and the lowest stock price is 50, four companies have the lowest share price, including Astrindo Nusantara Infrastruktur (BIPI), Exploitasi Energi Indonesia (CNKO), Darma Henwa (DEWA), SMR Utama (SMRU). The average stock price is 2,578.5279. The value of the standard deviation of the stock price after the announcement is 6,379.20528, which is higher than the average value according to the descriptive statistical analysis results. The data is heterogeneous, indicating that the distribution of the data varies.

There is a difference in the average value of share prices in the coal sector before and after the announcement of Law No. 7 of 2021. The average stock price decreased by 58.6803, meaning several companies experienced a decrease in stock prices. The standard deviation of the stock price also decreased by 124.74686 between before and after the legislation of the law.

Table 2. Ranks

		N	Mean Rank	Sum of Ranks
After Carbon Tax Legislation - Before Carbon Tax Legislation	Negative Ranks	95[a]	77.63	7,375
	Positive Ranks	41[b]	47.34	1,941
	Ties	29[c]		
	Total	165		

a. After Carbon Tax Legislation < Before Carbon Tax Legislation
b. After Carbon Tax Legislation > Before Carbon Tax Legislation
c. After Carbon Tax Legislation = Before Carbon Tax Legislation

Based on the table above, there is a difference between the stock price results before and after the legislation of Law No. 7 of 2021. There are ninety-five negative data, which means that the data decreased between before and after the legislation of Law No. 7 of 2021. The average decrease is 77.63 and the number of negative ranks is 7,375. It can also be seen that there is forty-one positive data, which means that the data increased before and after the announcement of the regulation of Law No. 7 of 2021. The average increase of positive data is 47.34 and the number of positive ranks is 1,941. Out of one hundred and sixty-five data, there are twenty-nine data ties or those that have the same value between before and after the legislation of Law No. 7 of 2021. This means that the data has not changed by twenty-nine.

Table 3. Test Statistics[a]

	After Carbon Tax Legislation - Before Carbon Tax Legislation
Z	-5.903[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

Based on the hypothesis test, the table above shows the sig. (2-tailed) value of 0.000 is less than 0.05. These results indicate a difference in stock prices before and after the legislation of Law No. 7 of 2021.

2) At the time of the First Delay of the Carbon Tax Implementation

Table 4. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Before the First Carbon Tax Delay	165	50	44,000	3,464.6971	8,716.97973
After the First Carbon Tax Delay	165	50	44,000	3,380.3332	8,000.63392
Valid N (listwise)	165				

Results indicate that the average share price of companies in the coal sector before the first delay in the implementation of the Indonesian carbon tax was 3,464.6971. Dian Swastika Sentosa (DSSA) has the highest share price of 44,000. The lowest share price is 50. Three companies have the lowest share price, including Exploitasi Energi Indonesia (CNKO), Darma Henwa (DEWA), SMR Utama (SMRU). The standard deviation results before the announcement of the first delay showed a value of 8,716.97973. The descriptive statistical analysis results show that the standard deviation value is higher than the average value, which means that the data is heterogeneous.

After the first postponement of carbon tax implementation, the highest share price is 44,000, including shares of Dian Swastika Sentosa (DSSA). The lowest share price is 50, two companies have the lowest share price, including Exploitasi Energi Indonesia (CNKO) and SMR Utama (SMRU). The average stock price is 3,380.3332. The value of the standard deviation of the stock price after the announcement is 8,000.63392 which is higher than the average value. It means that the data fluctuates.

There is a difference in the average value of share prices in the coal sector before and after the first delay in the implementation of the Indonesian carbon tax. The average stock price decreased by 84.3639, which means that there were several companies that experienced a decrease in stock price during the first delay of the Indonesian carbon tax implementation. The standard deviation value of the stock price also decreased by 716.34581 between before and after the first delay in the implementation of the Indonesian carbon tax.

Table 5. Ranks

		N	Mean Rank	Sum of Ranks
After First Carbon Tax Delay - Before First Carbon Tax Delay	Negative Ranks	50[a]	59.65	2,982.50
	Positive Ranks	86[b]	73.65	6,333.50
	Ties	29[c]		
	Total	165		

a. After First Carbon Tax Delay < Before First Carbon Tax Delay
b. After First Carbon Tax Delay > Before First Carbon Tax Delay
c. After First Carbon Tax Delay = Before First Carbon Tax Delay

Based on the table above, there is a difference between the stock price before and after the first delay in the implementation of the Indonesian carbon tax. There are fifty negative data, which means that these data have decreased between before and after the first delay in the implementation of the Indonesian carbon tax. The average decrease is 59.65 and the number of negative ranks is 2,982.50. It can also be seen that there are eighty-six positive

data, which means that eighty-six data have increased between before and after the first delay in the implementation of the Indonesian carbon tax. The average increase of positive data is 73.65 and the number of positive ranks is 6,333.50. There are twenty-nine data ties which means that these data have the same value before and after the first delay in the implementation of the Indonesian carbon tax.

Table 6. Test Statistics[a]

	After First Carbon Tax Delay - Before First Carbon Tax Delay
Z	-3.640[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

Based on the hypothesis test, the table above shows the sig. (2-tailed) value of 0.000 is less than 0.05. These results indicate that there is a significant difference in stock prices before and after the first delay in the implementation of the Indonesian carbon tax.

3) During the Second Postponement of Carbon Tax Implementation

Table 7. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Before the Second Carbon Tax Delay	165	50	35,050	3,565.5138	7,893.44595
After the Second Carbon Tax Delay	165	50	35,050	3,539.0538	7,925.69159
Valid N (listwise)	165				

Results show that the average share price of companies in the coal sector before the second delay in implementing the Indonesian carbon tax was 3,565.5138. Dian Swastika Sentosa (DSSA) has the highest share price of 35,050. The lowest share price is 50. Two companies with the lowest share price include Exploitasi Energi Indonesia (CNKO) and SMR Utama (SMRU). The results of the standard deviation at the time before the legislation of the Indonesian carbon tax showed a value of 7,893.44595, which is higher than the average value. It means that the data is heterogeneous because the distribution of the data varies.

After the announcement of the second postponement of the implementation of Law No. 7 of 2021, the highest share price is 35,050, including shares of Dian Swastika Sentosa (DSSA). The lowest share price is 50. Two companies have the lowest share price, including Exploitasi Energi Indonesia (CNKO) and SMR Utama (SMRU). The average stock price is 3,539.0538. The value of the standard deviation of the stock price after the announcement is 7,925.69159, which is higher than the average value. It indicates that the distribution of the data varies.

There is a difference in the average value of share prices in the coal sector before and after the second delay in implementing the Indonesian carbon tax. The average stock price decreased by 26.46, meaning several companies experienced a decrease in stock price during the second delay in implementing the Indonesian carbon tax. The standard deviation value of the stock price increased by 32.24564 between before and after the second delay in implementing the Indonesian carbon tax.

Table 8. Ranks

		N	Mean Rank	Sum of Ranks
After Second Carbon Tax Delay - Before Second Carbon Tax Delay	Negative Ranks	107[a]	72.75	7,784.50
	Positive Ranks	34[b]	65.49	2,226.50
	Ties	24[c]		
	Total	165		

a. After Second Carbon Tax Delay < Before Second Carbon Tax Delay
b. After Second Carbon Tax Delay > Before Second Carbon Tax Delay
c. After Second Carbon Tax Delay = Before Second Carbon Tax Delay

Based on the table above, there is a difference between the stock price results before and after the second delay in the implementation of the Indonesian carbon tax. There are one hundred and seven negative data, which means that these data have decreased between before and after the second delay in the implementation of the Indonesian carbon tax. The average decrease is 72.75 and the number of negative ranks is 7,748.50. On the other hand, there are thirty-four positive data points, which means that these data have increased before and after the first delay in the implementation of the Indonesian carbon tax. The average increase of positive data is 65.49 and the number of positive ranks is 2,226.50. Out of one hundred and sixty-five data, there are twenty-four data ties. This means

that these data have the same value before and after the second postponement of the implementation of Law No. 7 of 2021. Put another way, these twenty-four data have not changed.

Table 9. Test Statistics[a]

	After Second Carbon Tax Delay - Before Second Carbon Tax Delay
Z	-5.720[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

Based on the hypothesis test, the table above shows the sig. (2-tailed) value of 0.000 is less than 0.05. These results indicate that there is a significant difference in stock prices before and after the second delay in the implementation of the Indonesian carbon tax.

One of the factors that determines stock prices is government policy. In this study, there is a new policy related to carbon tax which is regulated by Law No. 7 of 2021. Information received by investors regarding the Indonesian carbon tax policy can affect investors' decisions to buy, hold, or sell shares of energy companies. In turn, this information can also affect the share price of those companies.

Research findings suggest that the average stock price of coal sector companies decreased following the legislation of Law No. 7 of 2021, the first and second delay in implementing the Indonesian carbon tax. The previous stock price was higher than the stock price after the delays. Furthermore, the significance value of the three events is less than 0.05, indicating a substantial disparity in stock prices between the previous and post-event periods.

The stock prices experienced a decline following the legislation of the Indonesian carbon tax. This was due to investors' concerns about the impact of the carbon tax on the energy sector listed on the Indonesia Stock Exchange. Investors might respond to information from external sources to make decisions. The decision could be related to selling the energy companies' stock or withholding stock purchases in response to implementing the Indonesian carbon tax. Furthermore, the implementation might incur additional expenses for energy companies. In turn, this potentially reduced their profits. Investors' reactions to the first and second delays in the implementation remained similar. Additionally, the geopolitical conditions, which affected energy prices during that year, might cause investors to exercise caution when purchasing energy company shares.

Compared to Australia, which faced challenges in implementing a carbon tax and eventually ended up abolishing it, Indonesia also has challenges in implementing a carbon tax, as indicated by delays in its implementation. Apart from the delays, more detailed rules have not been introduced, as usually regulated by the Minister of Finance. Without a clear guideline, energy companies might encounter challenges related to investment decisions concerning carbon emission reduction.

5. CONCLUSION

Law No. 7 of 2021's legislation regarding the Indonesian carbon tax implementation has resulted in a decline in the country's stock prices of coal companies. This decline occurred both before and after the law was enacted. The postponements of the Indonesian carbon tax, which occurred twice, also decreased the share price of coal power companies. These postponements indicate serious challenges the Indonesian government faces in implementing carbon taxes. This situation may affect the country's commitment to reducing carbon emissions by 2030.

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