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WHAT DRIVES FIRMS TO ENTER CARBON MARKET? AN EXPERIMENTAL EVIDENCE

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ABSTRACT

Carbon exchange is a very new issue in Indonesia. Therefore, understanding the potential of carbon exchange to realise Net-Zero Emission is crucial. This study explores the factors that can encourage companies to enter the carbon exchange by understanding behavioural and non- behavioural factors. Psychological theory is also used to explain the motivation of corporate managers in making strategic decisions. This study is a quantitative study using experiments. The experimental design used is 2x2x2 between subjects. Data were analysed using analysis of variance (ANOVA). The results of this study indicate that regulatory pressure, financial incentives, and international trade are factors that can encourage companies to enter the carbon exchange/carbon market. In addition, carbon trading is unable to outperform carbon taxes in the short term due to cost efficiency and investment costs in companies. In addition, this study can be a reference for policy makers to optimise the role of IDXCarbon in carrying out its functions and encourage more companies to be involved in carbon exchange trading to realise Net-Zero Emission by 2060.

Keywords :
Carbon Market, Regulatory Pressure, Financial Incentive, International Trading.

JEL Classification : G1, G4, L2, L5

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I. INTRODUCTION

Indonesia is committed to achieving a low-emission future through the Enhanced Nationally Determined Contribution (ENDC) document, by setting a target of reducing greenhouse gas emissions by 31.89 percent unconditionally and without international assistance, or 43.2 percent with international support, from Business as Usual (BAU) by 2030. Through Presidential Regulation No. 98 of 2021, it is regulated regarding the Economic Value of Carbon, where one of the steps to reduce emissions is through the Carbon Trading mechanism. Therefore, the Indonesia Carbon Exchange (IDXCarbon) was launched in Indonesia to support the acceleration of Indonesia's Net-Zero Emission target by 2060. A business license as a Carbon Exchange Organiser has been granted to the Indonesia Stock Exchange (IDX) by the Financial Services Authority (OJK) through Decree number KEP-77/D.04/2023 on September 18, 2023. The Indonesia Stock Exchange (IDX) is committed to providing carbon trading infrastructure in Indonesia supervised by the Financial Services Authority, with a focus on transparency, liquidity, efficiency, and easy accessibility. This government effort is demonstrated through the issuance of Law Number 4 of 2023 Article 24 concerning the Development and Strengthening of the Financial Sector (PPSK Law) which states that carbon trading, both domestic and international, must be carried out through a carbon exchange mechanism. The carbon market mechanism is carried out in two ways, namely the allowance market and the offset market.

Some countries that have already become users of carbon exchanges are the European Union, Canada, the United States, China, Australia, South Korea, New Zealand, and most recently Japan. The earliest and still running emission trading scheme is the European Union's greenhouse gas emission trading scheme (EU ETS), which is also the largest carbon emission control and trading system in the world to date (Zhang & Zhang, 2019). The success of these countries in managing the greenhouse gas effect is a hope for Indonesia to be able to optimise the carbon exchange which is relatively new. Especially the carbon exchange practice in the European Union which has been going on since 2005 which

has become a model for many other countries in implementing carbon trading schemes. Zhu et al. (2020) mentioned that examining the impact of carbon trading mechanisms on green development efficiency does not only provide empirical evidence on the mechanisms, but also provides valuable insights for other countries.

Although the development of the carbon exchange in Indonesia is the largest in ASEAN, the accumulated trading volume on the carbon exchange until July 3, 2024 has only reached 608,740 tons of CO_2, with a value of IDR 36.78 billion. In practice, Suboptimal carbon swap trading occurs because carbon swaps are not yet popular in many companies (Zhang et al., 2019). Currently, Indonesia has only implemented an offset market, namely business actors trading carbon units resulting from the reduction or absorption of greenhouse gas emissions through mitigation projects. Carbon units in this mechanism are called Greenhouse Gas Emission Reduction Certificates (SPE-GRK). Each SPE-GRK traded through IDX Carbon is categorised based on certain standards, where buyers will obtain detailed information about the related project after the transaction is completed. Moreover, SPE-GRK can be traded based on projects through Auction, Marketplace, or Negotiation mechanisms. Through the Carbon Exchange, companies have the ability to conduct buy and sell transactions for certain SPE-GRK. In its implementation, the carbon market in Indonesia is expected to be able to implement a market allowance mechanism so that the net zero emission target can be achieved according to the target.

Engaging in carbon market mechanisms through allowance markets or offset markets is not a simple managerial decision. With global climate change continuing, businesses face several challenges that could impact their operations (Shankar & Gupta, 2024). The company has been operating for quite a long time with settled operational practices, so changing the working mechanism in line with the carbon exchange trading mechanism requires quite a long time (Wang et al., 2022). In addition, the government has also recently launched a carbon tax that will be implemented effectively in 2025. Many companies prefer to pay fines or carbon taxes because it is easier and does not require operational changes

(Royapoor et al., 2019; Grieder et al., 2022). This is the main trigger for why the carbon exchange in Indonesia has not shown rapid growth.

In the literature, previous research through experimental approaches often shows that companies' decisions to enter the carbon market are influenced by simulations of market conditions, such as the availability of carbon credits, carbon costs, and the impact of carbon trading on profitability (Grieder et al., 2022; Abadie et al., 2024). Experiments show that companies are more likely to engage in carbon markets when they see clear economic benefits or when the regulatory framework is strictly enforced (Zhang et al., 2019; Zhang & Zhang, 2019). To achieve green growth and protect the environment, governments generally adopt a variety of policy tools to implement environmental regulations (Wang et al., 2019), including by creating a carbon market mechanism (Cheng et al., 2015). Companies are often motivated to enter the carbon market by regulations or government mandates that require them to limit carbon emissions (Zhang & Zhang, 2020). Such as China's success in reducing carbon intensity by 19.79% as an impact of carbon trading (Zhang et al., 2016; Wang et al., 2019). Compliance with these regulations is a strong driver, especially if there are sanctions for those who do not comply (Gezelius & Hauck, 2011).

The form of regulation applied can differ between countries, in Indonesia itself the government issued regulations related to carbon exchanges and carbon taxes. In practice, companies have the option to enter the carbon exchange with an allowance market or offset market scheme. But companies must also comply with tax regulations regarding carbon taxes (Linden et al., 2024), because the carbon tax policy has been proven to significantly reduce carbon emissions (Chen et al., 2020). This is explained by the compliance theory that individuals will obey the directions of parties who have higher power (Peat et al., 2022). Both regulations have the same goal, namely to achieve zero emissions. Cao et al. (2019) mentioned in his research that carbon tax can reduce the risk of emissions in China because the nominal tax paid is high enough so that companies or households will avoid producing emissions. In addition, the

carbon trading mechanism, as well as investment in pollution control, have a positive impact on the efficiency of green development (Cheng et al., 2015; Zhu et al., 2020).

In addition to regulatory factors, the potential for cost savings or financial gains is a significant motivator that influences company management in making decisions to enter the carbon exchange (Wang et al., 2019; Zhang et al., 2019). Companies will enter the carbon market to benefit from selling excess carbon credits or to avoid the costs associated with exceeding their emissions limits by purchasing credits (Heintzman, 2021). Based on reinforcement theory, individuals will make decisions based on the consequences of the actions taken, both positive and negative (Wijayanti & Yandra, 2020). Positive consequences in the form of incentives will encourage policy makers to participate in the carbon exchange either through the allowance market or offset market mechanisms (Shen et al., 2016). The Emissions Trading System is believed to be a means of providing cost-effective financial incentives for carbon emitters to implement emission reduction measures. Jotzo (2013) also stated that incentive mechanisms are needed to make carbon exchanges effective.

The last factor that companies consider in entering the carbon market is business activities in the form of global/international trade. Implementing carbon emission trading can save carbon reduction costs to meet CO_2 emission limit requirements (Zhang & Zhang, 2020). In addition, companies are always driven by the desire to remain competitive in their industry. As more companies adopt carbon reduction practices, entering the carbon market becomes a way to keep up with industry standards and avoid being left behind by competitors. For companies operating in global markets, especially in regions with strict carbon regulations (such as the European Union), entering the carbon market may be necessary to maintain access to those markets. Exporting to countries with carbon regulations requires compliance with carbon trading schemes. This is necessary to avoid non-compliance with a predetermined regulation or

scheme that is part of the decision-making behaviour (Oyanedel et al., 2020).

Carbon trading is seen as a strategy to reallocate carbon permits and lower the costs of emission reductions, which can also affect energy consumption patterns and the distribution of air pollution emissions (Zhang & Zhang, 2020). This can bring benefits or negative impacts on environmental health at the regional level. Therefore, this study explores the factors that can encourage companies to enter the carbon exchange in Indonesia through an experimental method. The development of carbon exchanges in Indonesia is still new and quite slow compared to European Union countries and China. Therefore, more research is needed to find factors that can encourage companies to engage in carbon exchange trading and be willing to invest in low-carbon technologies in order to contribute to zero emissions and get fair compensation.

II. LITERATURE REVIEW

A. Carbon Market/Exchange

The carbon exchange is a carbon trading market for companies that need carbon emission quotas and companies that have carbon emission savings (Luo et al., 2021). Companies that can reduce carbon emissions more efficiently have the opportunity to sell additional permits on the emissions market to companies that do not or cannot easily reduce carbon emissions (Tsai, 2020). Based on Porter's hypothesis, the carbon emission trading mechanism as a means of environmental regulation can provide environmental and economic benefits, as well as create mutually beneficial opportunities for energy conservation, emission reduction and economic growth (Zhu et al., 2020). There are two carbon trading mechanisms, namely the allowance market and the offset market. The allowance market is a limitation and trading mechanism that is usually applied to the mandatory Carbon Market. In this mechanism, certain business actors determined by the government receive a category in the form of an emission quota allocation for a certain period of time. If the

business actor exceeds this limit, they can buy carbon units from other business actors who have more or unused quotas. In contrast to the allowance market, the offset market is a scheme where business actors trade carbon units resulting from the reduction or elimination of greenhouse gas emissions by certain business actors and/or other climate change mitigation actions (Heintzman, 2021). Companies can purchase these carbon units to achieve their emission reduction targets and meet their commitments to carbon neutrality or net-zero. In line with Worrall et al. (2009) and Zhu et al., (2020) which states that nowadays carbon offsetting can support environmental improvement.

In Indonesia, there are four trading mechanisms available on the carbon exchange, namely auction, regular trading, negotiated trading, and marketplace. Through the auction mechanism, the government or owners of emission mitigation projects can sell carbon units through auction, where prospective buyers submit bids according to the desired volume and price. Regular trading allows trading to take place through a continuous auction, so that all parties can participate and convey their buying or selling interests in real-time. In negotiated trading, IDXCarbon facilitates previously agreed transactions to be completed with transparency and security through the IDXCarbon system. Meanwhile, through the marketplace, owners of emission mitigation projects can sell their carbon units at a predetermined price. Through this mechanism, the government, companies, and owners of emission mitigation projects can buy and sell carbon units. This not only supports overall emission reductions, but also allows companies that have excess emission quotas to sell them to companies that need additional quotas to meet their targets (Zhang et al., 2019). In addition, accurate and stable carbon price estimates are crucial for all stakeholders including regulators and investors in the carbon market to ensure that the decision to enter the carbon exchange is the right decision (Hao et al., 2020).

B. Compliance Theory

Compliance theory is a theory that studies how individuals or organisations comply with the rules, regulations and policies set by authorities (Gezelius & Hauck, 2011). This theory focuses on the motivations and mechanisms behind compliance as well as ways to maintain and increase compliance levels (Etienne et al., 2011). Compliance Theory offers an understanding of the dynamics of compliance with rules and policies, and how various factors influence individual and organisational decisions to comply with or violate those rules (Gezelius & Hauck, 2011). In relation to carbon exchange, strict and reasonable environmental regulations encourage companies to innovate technologically, creating a win-win situation for the economy and the environment (Wang et al., 2022). The government has created a carbon exchange trading mechanism that not only brings efficiency to companies in the long term, but also supports zero emissions. Through this complete facility, companies can take advantage of opportunities to improve their corporate image and get proper financial compensation by transacting on the carbon exchange. Gezelius & Hauck (2011) mentioned that each compliance motivation can be influenced through the prerequisites that can be set for compliance such as law enforcement. One of them is related to the carbon exchange mechanism for companies on the stock exchange.

C. Reinforcement Theory

Reinforcement theory was introduced by B. F. Skinner in 1977 which explains the motivation of individuals, namely that individuals need encouragement to act. According to reinforcement theory, individuals act based on the consequences that follow their actions (Wixted & Gaitan, 2022). This theory explains that human behaviour can be changed through reinforcement or punishment. This theory states that behaviour tends to be reinforced or maintained if followed by positive outcomes such as incentives, while undesirable behaviour can be reduced through punishment or reduced incentive (Wijayanti & Yandra, 2020). Reinforcement in this theory can be in the form of positive and negative

reinforcement. In practice, many companies apply positive reinforcement to encourage others to behave as expected (Shen et al., 2016). This theory is practiced in various fields including management. In the practice of carbon exchanges, the existence of incentives for companies entering the carbon exchange can increase managerial motivation to make decisions that are in line with the intentions and objectives of the government. Incentives can be given by providing compensation to companies that have low or zero carbon emissions (Jotzo, 2013). This practice will motivate companies to reduce emission production and sell their emission quotas on the carbon exchange. Through this practice, companies get capital from the sale of emission quotas and financial compensation.

D. Regulatory Pressure and Carbon Market

The relationship between environmental regulation and economic growth has long been a hot topic of debate among academics (Wang et al., 2022). Regulatory pressure becomes mandatory for companies established in Indonesia. The government issues policies related to CO_2 reduction through various regulations (Wang et al., 2019), especially in Indonesia, namely by launching a carbon exchange managed by the Indonesian stock exchange and providing alternative policies through the Law related to carbon taxes. Currently, emission trading schemes and carbon taxes are the most common climate policies worldwide (Tsai, 2020). Both policies have different emission reduction mechanisms. In the carbon exchange, the government encourages companies to conduct carbon trading transactions, while in the carbon tax mechanism, the government imposes tax rates on companies that produce emissions. Compliance behaviour to regulatory pressures either through the carbon exchange mechanism or the carbon tax is explained in compliance theory which explains that individuals will follow orders from people who have power (Etienne et al., 2011).

The results of previous research conducted by Grieder et al. (2022) showed that the carbon offset program on the carbon exchange can reduce CO_2 levels. Therefore, the Indonesian government facilitates the

carbon exchange trading mechanism through IDXCarbon. Research by Heintzman (2021) mentioned that the offset market mechanism with the right price can increase the desire of individuals to participate in carbon trading. In addition, Wang et al. (2022) mentioned that there is a positive relationship to some extent between China's carbon trading system and low-carbon economic transformation. This relationship can create a win-win situation between environmental and economic benefits and efficiency for enterprises (Goodwin et al., 2024). Companies in high-emission industries should be encouraged to increase investment in emissions reduction (Song & Liu, 2024). The Chinese government has also implemented various policy instruments, such as regulations and standards to optimise the carbon market (He et al., 2024).

However, the development of carbon exchange in Indonesia is still very slow. This is because the traditional economic view states that economic growth and environmental protection are not mutually beneficial and can even be detrimental to a country's economic development, because strengthening environmental regulations tends to increase companies' operating costs and reduce their technological innovation capabilities (Wang et al., 2022). In order to reduce emissions and take advantage of carbon trading, companies must transform production processes with better technology (Song & Liu, 2024). This triggers high investment costs. Not all companies have good financial capabilities to change their operational systems. This causes companies to look for other alternatives to continue operating as usual by paying fines or paying taxes.

On the other hand, the government has also issued a policy related to carbon tax which will be effective in 2025. Carbon tax is a policy instrument that aims to reduce the production and consumption of goods and services that produce CO_2 intensively (Grieder et al., 2022). By requiring companies to pay taxes on the emissions they produce, companies will think about reducing the emissions produced from the production process (Tsai, 2020). This policy alternative is often a solution for companies that are not yet interested in entering the carbon exchange. Both policies need to be studied to find out which system is preferred by companies to

contribute to reducing emissions (Wang et al., 2022). Truong-Dinh et al. (2023) mentioned that it is very important to investigate individual intentions in deciding to make carbon compensation payments for carbon emission production. Based on this explanation, the hypothesis is formulated as follows.

H1a: Regulatory pressure can increase intention to trade on carbon market
H1b: Carbon trading is more capable of increasing the intention to enter the carbon market compared to carbon tax.

E. Financial Incentive and Carbon Market

Environmental concern is considered by many academics as a factor of pro-environmental behaviour, which can be defined as actions by individuals or groups aimed at improving the quality or sustainability of the natural environment (Chen et al., 2017; Heintzman, 2021; Aamaas & Grimsby, 2024). However, this behaviour does not apply to all policy makers in the company. Top level management will take policies that are beneficial, especially in financial aspects. This is explained by reinforcement theory which states that individual behaviour is based on the consequences or results of actions (Wixted & Gaitan, 2022). Wang et al. (2022) mentions that environmental incentives play an important role in driving low-carbon economic transformation and energy transformation. This shows that the existence of compensation for companies that can trade their emission quotas will make companies reduce carbon emissions resulting from operational processes and contribute to the carbon exchange. Economic losses can be experienced if the government ignores the needs of the low-carbon market, therefore high incentives are needed to make the carbon market effective (He et al., 2024).

In the research by Song & Liu (2024), The government needs to take various policies to regulate carbon trading including encouraging companies in high emission industries to increase investment for emission reduction, strengthening supervision of the carbon trading market, providing technical support, and providing green innovation incentives.

These incentives motivate companies to obtain them by following the mechanisms created by the government. Egenhofer (2011) and Jotzo (2013) mentioned that incentives will make carbon exchanges more effective than carbon taxes. Companies choose to engage in carbon markets to gain profits from selling excess carbon credits or to avoid costs from exceeding their emission limits by purchasing carbon credits. In practice, the Chinese government has also implemented various policy instruments, such as financial incentive policies for companies (He et al., 2024). Based on the explanation, the hypothesis is formulated as follows.

H2: Financial incentives can increase intention to trade on carbon market

F. International Trading and Carbon Market

Environmental pressures arising from production and service activities have attracted much attention worldwide (Bi et al., 2024). Companies that engage in international trade activities such as exporting goods or services to countries with strict carbon regulations, entering the carbon market is often a necessity. The carbon trading system encourages the transition to a low-carbon economy (Wang et al., 2022). Exported products or services must meet the environmental standards applicable in the destination country. If companies do not comply with carbon trading schemes, they may be subject to additional tariffs or sanctions, or even be banned from accessing those markets. This is in line with compliance theory, which explores the various motivations behind compliance, including internal factors such as ethical awareness, social responsibility, and personal values, as well as external factors such as the threat of punishment, incentives, and monitoring (Gezelius & Hauck, 2011; Peat et al., 2022). As is the case in the European Union, companies that wish to continue operating in or doing business with European Union countries need to purchase or receive an allocation of carbon emission permits to cover their emissions. By participating in the carbon market, companies can adjust their operations to comply with these regulations, maintain competitiveness, and ensure that their products remain accessible in important global markets.

Overall, engaging in carbon markets allows companies to manage regulatory risk, ensure compliance, and capitalise on trading opportunities in regions with stringent environmental regulations, which in turn helps them maintain access and competitiveness in international markets. As is the case in China, carbon trading is an important market tool in driving growth and reducing carbon emissions in the industrial sector (Zhang et al., 2020). In addition, intensive research and development activities can support efficiency and improve environmental performance (Zhu et al., 2020). Therefore, understanding the company's business activities is very necessary to be able to encourage companies that conduct international trade to be able to participate in IDXCarbon. Based on the explanation, the hypothesis is formulated as follows.

H3: International trade can increase intention to trade on the carbon market.

III. RESEARCH METHOD

A. Research Design and Participant

This study is a quantitative study using an experimental method as a method of data collection. The experimental design is 2x2x2 between subjects. The dependent variable in this study is the intention to trade carbon exchanges, while the independent variables in this study are regulatory pressure, financial incentives, and international trading. Participants in this study were final year accounting students who had understood the overall business process. The use of students as practitioner counsellors is used referring to studies from Liyanarachchi & Newdick (2009) which shows that differences in profession, both as practitioners and academics, do not produce significant differences in understanding the experimental case material. Furthermore, Miceli et al. (2008) found that the results of the study with the participation of practitioners were not much different from the results involving students. The suitability of students as participants in this study was tested through a pilot test conducted before the experiment took place.

B. Variable Measurement

The dependent variable in this study was measured using an 8-point Likert scale to assess participants' intentions to trade on the carbon exchange. Furthermore, regulatory pressure emphasises government regulations and mechanisms that have been created by the government in the carbon exchange. Regulatory pressure has two levels, namely carbon trading and carbon tax. Furthermore, financial incentives emphasise the compensation obtained when entering the carbon exchange, so that financial incentives have two levels, namely with incentives and without incentives. Finally, trading practices emphasise international buying and selling transactions carried out by companies, so that trading practices use two levels, namely international and non-international trade.

C. Experimental Procedures

The experiment was conducted in five stages. In the first stage, participants were randomly divided into 8 groups with a minimum of 10 people in each group. This number is in accordance with the guidelines from Nahartyo (2013). Each group was given a different treatment that had been set in the experimental instrument. Second, all participants were asked to sign an agreement as experimental subjects. Next, participants were asked to read information about the general profile of the company whose treatment had been adjusted. At this stage, participants would read according to the conditions that had been randomised in the research instrument. Fourth, participants were asked to respond by choosing whether or not they would enter the carbon exchange using an 8-point Likert scale (from very unlikely to very likely) to measure the intention to trade on the carbon exchange. In the last stage, participants were asked to answer questions related to manipulation checks and demographics. At this stage, participants who did not pass the manipulation check would be excluded from data processing. This experiment was conducted using paper base with experimental tasks developed by the researcher.

D. Data Measurement

Hypothesis testing is done using analysis of variance (ANOVA). ANOVA is used because researchers test asymmetric correlations between independent variables measured by nonmetric scales (categorical or nominal) and dependent variables measured by metric scales, namely ratios or intervals. In this statistical technique, researchers observe differences in average scores in various categories of predetermined independent variables while considering variations in each category. In this study, testing using ANOVA was carried out to see the direct effect and interaction effect between independent and dependent variables. Furthermore, a different test was carried out to determine the difference in the effect of two different groups.

IV. RESULT AND ANALYSIS

A. Participant

Participants in this study were final year students taking accounting studies. Business students are fully aware of the duties and authorities of top-level management. The students selected were those who had taken business courses such as management accounting, management control systems, behavioural accounting, strategic management and leadership, and business ethics. Participants in this study numbered 114 people who were divided into eight groups with different treatments. The experiment was conducted in three batches with randomisation techniques. The following are the demographics of the participants categorised by gender, batch, and work experience.

Table 1. Respondent Demographics

Data	Category	Frequency	Percentage
Gender	Male	37	32.46%
	Female	77	67.54%
Batch	1	39	34.21%
	2	42	36.84%
	3	33	28.95%
Work Experience	Yes	19	16.67%
	No	95	83.33%

Furthermore, as a control variable in this study, demographic variable testing was carried out as follows.

Table 2. ANOVA Test Results for Respondent Demographics

Test between subject effect				
Dependent variable: Intention to Enter Carbon Trading Market				
Source	SS	Df	F	Sig.
Gender	10.652	1	2.313	.131
Job Experience	14.599	1	3.170	.078
Batch	5.276	2	.573	.566

The results of table 2 show that demographic variables do not have a significant effect on the intention of policy makers to trade on the carbon exchange. This means that even though demographics do not occur in this study.

B. Pilot Test

The pilot test is part of the pre-experiment that aims to ensure that the experimental instrument can internalise participants with real environmental conditions. The pilot test was conducted two times with the first agenda being the adjustment of the experimental instrument. In the first pilot test, the researcher conducted a pilot test on academics through

focus group discussions to find out the shortcomings of the experimental instrument. Participants read the experimental material and provided comments directly on the experimental material. Through this stage, the researcher received more input on writing the treatment in order to be better able to internalise participants. In the second pilot test, the researcher used 20 Accounting students to take part in the experiment. In the second pilot test, the implementation was set to follow the actual experiment. Participants were asked to fill in the experimental material according to the experimental procedure up to the manipulation check stage. Data obtained from the second pilot test showed that only three participants did not pass the manipulation check. This shows that most participants have understood the experimental material, so the experiment can be carried out on other participants.

C. Hypothesis Test

Hypothesis testing is done by comparing the average of each group with different treatments. ANOVA is done to see the main effect as stated in table 3.

Based on table 3 panel A, it is known that regulatory pressure, financial incentives, and international trade can encourage individuals to enter the carbon market. This shows that hypothesis 1a, hypothesis 2, and hypothesis 3 are significantly supported. Panel B shows the mean for every group that is used as data analysis. Furthermore, to determine the difference in preferences between carbon trading and carbon tax, researchers conducted a difference test between groups that received carbon trading and carbon tax treatments. The following are the test results.

Table 4 shows that the comparison of the two groups (carbon trading and carbon tax) does not have a significant difference in the intention to enter the carbon market. This indicates that hypothesis 1b is not significant. Overall, both government regulations related to carbon exchanges and carbon taxes can both increase the intention to enter the

carbon exchange, but cannot prove that carbon exchanges are more capable of encouraging the intentions of policy makers. This happens because carbon taxes are also attractive in the short term, so participants are not able to significantly choose carbon exchanges.

Table 3. ANOVA Test Results, Means (SD), and Comparisons between Groups

Panel A: *Test Between Subject Effect*

Dependent Variable: Intention to Enter Carbon Market

Sumber	SS	Df	F	Sig
Corrected Model	457.781[a]	7	122.692	<.001
Intercept	2712.817	1	5089.532	<.001
RP	9.414	1	17.662	<.001
FI	440.267	1	825.987	<.001
IT	4.315	1	8.096	.005
RP * FI	.265	1	.497	.482
RP * IT	.497	1	.933	.336
FI * IT	.497	1	.933	.336
RP * FI * IT	2.877	1	5.397	.022
Error	56.500	106		
Total	3226.000	114		
Corrected Total	514.281	113		

R Squared = 0.890 (Adjusted R Squared = 0.883)

Panel B: *Means* (SD) and Number of Participants in Each Group

Levels of Conducting International Trade

		Financial Incentive	
		Yes	**No**
Regulatory Pressure	**Carbon Trading**	$\bar{x}$ = 7.57 (0.76) N = 14	$\bar{x}$ = 3.39 (0.47) N = 14

	Carbon Tax	$\bar{x}$ = 6.64 (0.84) N = 14	$\bar{x}$ = 2.80 (0.68) N = 15

Level Not Doing International Trade

		Financial Incentive	
		Yes	No
Regulatory Pressure	Carbon Trading	$\bar{x}$ = 6.60 (0.91) N = 15	$\bar{x}$ = 3.21 (0.70) N = 14
	Carbon Tax	$\bar{x}$ = 6.57 (0.85) N = 14	$\bar{x}$ = 2.36 (0.50) N = 14

Table 4. T-Test Results

Dependent variable: Intention to Enter Carbon Market				
Source	t	Df	F	Sig.
Equal variances assumed	1.591	112	0.446	0.506
Equal variances not assumed	1.591	111.870		

D. Discussion

This study explores the factors that influence companies to trade on carbon exchanges in Indonesia. It is known that the carbon trading system to promote energy conservation, marketisation of emission reductions, and low-carbon economic transformation has been widely recognised worldwide (Wang et al., 2022). The results of this study indicate that regulatory pressure is able to encourage the intention of policy makers to invest or carry out buying and selling activities on the carbon exchange. This is in line with research conducted by Xu & Li (2024) which shows that the Environmental Protection Tax Act significantly reduces corporate carbon emissions. Previous research that focuses on behavioural interactions between companies and other stakeholders shows that regulatory sanctions are still needed to encourage corporate policy-

making behaviour (He et al., 2024). In addition, conducting an evaluation related to the effectiveness of carbon mitigation policies is very important as a basis for designing future policies (Cheng et al., 2015). To make organisations more accountable for investing in carbon reduction, governments need to adopt rigorous assessments of these investments and carbon disclosures made by companies (Abadie et al., 2024).

It is also found that carbon market and carbon tax cannot be proven which one is more able to increase the intention to enter the carbon market. This is because both have the same goal, namely to minimise carbon emissions. However, in the short term, carbon tax is more popular than carbon trading. This is because entering the carbon exchange requires a lot of money, especially to invest in low-emission technology. In the long term, companies will start to switch to carbon trading because they are encouraged by strict regulations. This result is in line with research Luo et al. (2021), with the existence of carbon tax regulations, companies can use external environmental costs to be converted into internal costs (carbon costs) through technology investment to encourage carbon emission reductions.

The Environmental Protection Tax Law encourages companies to reduce carbon emissions in two ways, namely by increasing investment in environmental protection and encouraging green innovation, which in turn supports the transition to low-carbon development (Xu & Li, 2024). The government has adjusted fiscal incentive mechanisms, monitoring policies, and carbon emission quota allocations based on the status of industrial development in relation to carbon emissions (He et al., 2024). This is because the emissions trading scheme contributes greatly to low-carbon development (Zhang & Zhang, 2019). Carbon trading is a crucial market tool to stimulate growth and reduce carbon dioxide emissions in China's industrial sector (Zhang et al., 2020). Research findings by He et al. (2024) provide insights for developers to participate in the carbon trading market and for governments to develop effective carbon trading mechanisms.

In addition to regulatory pressure, incentives are a motivator for companies to contribute to the carbon exchange. This result is in line with research conducted by Song & Liu (2024) that to increase investment in reducing emissions, can be achieved by providing financial support so that the enthusiasm of companies to reduce emissions and short-term negative impacts for companies. To achieve the goal, energy transformation through carbon trading can be used as an incentive mechanism for companies that need capital (Song & Liu, 2024). In addition, there are clear differences in the costs and incentive effects of the two types of mechanisms between taxation and trading. In terms of costs, carbon trading has lower information costs compared to carbon taxation (Zhang et al., 2016). However, the implementation of the trading mechanism requires greater costs than taxation because it requires investment in emission reduction technology. In terms of incentives related to emission reduction, carbon trading will be more effective than carbon taxation (Egenhofer, 2011). The government must implement appropriate incentives and regulatory policies to guide developer behaviour in investing (He et al., 2024).

Another factor that influences the intention of policy makers to enter the carbon market is international trade treaties. Companies that have multinational transactions, especially with European Union countries and China, have a stronger incentive to enter the carbon exchange. This is related to the regulations applied in these countries. In line with research conducted by Du et al. (2024) which provides support for companies to adopt low-carbon practices. It also refers to the European Union's greenhouse gas emissions trading scheme (EU ETS) which is the world's largest carbon emissions trading scheme (Zhang & Zhang, 2019), so that companies involved in international trade must follow the regulations in place to avoid sanctions. Several factors that make the carbon trading market immature are unstable prices, lack of transparency and regulation, lack of trading volume and liquidity, and lack of international cooperation and coordination (Song & Liu, 2024). For companies that only make domestic transactions, they are not so interested in joining the carbon exchange. But this can be avoided by providing compensation that is

commensurate with the company's efforts and sacrifices to support emission reduction.

V. CONCLUSION AND RECOMMENDATION

A. Conclusion

This study explores the factors that encourage companies to invest in carbon exchanges in Indonesia, either through allowance market or offset market mechanisms. Experiments prove that regulations issued by the government can encourage companies to make sales and purchases on carbon exchanges. In addition, many decision makers prefer to pay fines or carbon taxes rather than starting to invest in emission reduction technology in order to join the carbon exchange. The reason is, paying taxes is quite easy compared to setting aside investment funds whose results take a long time to be enjoyed. However, carbon exchanges provide long-term benefits for companies, so accurate and stable carbon price estimates are crucial for policy makers, regulators, and investors in the carbon market to ensure that the decision to enter the carbon exchange is the right decision. Carbon taxes and carbon trading have very different theoretical foundations that involve different interpretations of externalities in the economy. Therefore, the government also has an obligation to formulate appropriate and accurate environmental policies.

In the carbon exchange, if a company's carbon emissions exceed its quota, the company will try to avoid financial penalties for excessive emissions. Therefore, the company will increase the cost of purchasing carbon emission rights and will also develop new technologies or purchase new equipment to reduce emissions. This has an impact on increasing the company's operating costs and reducing profits in the short term. Therefore, incentives are needed to maximise the performance of the carbon exchange. In addition to incentives, business practice factors also motivate companies to invest in carbon exchanges or invest in low-emission technologies. For companies operating in the global market, especially in regions with strict carbon regulations such as the European

Union, participation in the carbon market may be necessary to maintain access to the market. Exports to countries with carbon regulations require companies to comply with applicable carbon trading schemes. With more and more companies adopting carbon reduction practices, entering the carbon market is an important step to follow industry standards and avoid being left behind by competitors.

This study provides practical and theoretical contributions. Practically, this study can be a reference for the government in encouraging carbon exchange trading in Indonesia by considering the behavioural and non-behavioural aspects of the company. In addition, the government can also guarantee the performance of carbon emission trading through strict regulations and provide compensation for companies that have excess emission quotas. Theoretically, this study strengthens the reinforcement theory and compliance theory. These two theories are behavioural theories that can also be used to explain the behaviour of companies in making business decisions, which in this study relate to the intention to trade on the carbon exchange. Individuals in making strategic decisions are influenced by regulations made by the government and the positive or negative consequences of the decision, which in this study are positive consequences in the form of incentives.

This study has several limitations. First, the experimental subjects used were business students as counsellors. Students usually have quite high idealism so that bias is possible. Therefore, further research can use practitioners as subjects and combine them with interviews with company management (policy makers or managers), so that other factors that are more relevant and not thought of by business students can be identified, and it can strengthen the validity of the study and its policy implications. Second, the subjects of this study used students in Yogyakarta, and it would be better if the subjects are expanded to use several regions so that the research results can be more generalised. In addition, adding students' perceptions about corporate image building and decision making to add depth to the research and linking it to practical results is also necessary in experimental research.

Further research is still needed to support the development of carbon exchange in Indonesia which has not reached a year. Especially finding the right motivator to encourage companies to get involved in carbon exchange trading such as environmental awareness and social image, into the analysis to capture the broader motivations and challenges facing companies in adopting carbon markets. In addition, exploring the impact of carbon exchange trading is also very important to control the risks that may arise in the future. In addition to the accompanying risk issues, further research can explore further whether the carbon trading market in Indonesia has provided appropriate incentives for companies, and whether fluctuations in carbon trading prices have an impact on the company's stock price. Lastly, further research can conduct a comparative analysis of carbon market practices in several countries in the world to determine the similarities and differences in carbon market mechanisms and implementation.

B. Policy Recommendations

This study proposes several policy and program recommendations that can accelerate the growth of the carbon exchange, namely as follows.

1. Massively, OJK and stakeholders related to the carbon exchange are quite aggressive in encouraging the carbon exchange as a secondary market through the development of infrastructure and technology that is already very adequate. Therefore, as one of the steps that can encourage carbon trading, the government can accelerate the Net Zero Incubator program and invite listed companies and issuers to join the program so that the growth of the carbon exchange can take place quickly.

2. The government needs to strengthen carbon emission market regulation to ensure fairness, transparency and stability. This step can reduce the impact of market fluctuations on stock prices, increase corporate confidence in carbon emission trading and encourage their active participation.

3. Governments can encourage companies to increase research programs and the application of emission reduction technologies by offering technical support and green innovation incentives. This can lower the cost for companies to purchase carbon emission rights or emission reduction technologies.

4. Cognitive factors are one of the factors that determine managerial decisions. Therefore, OJK can work with academics to improve literacy and inclusion of companies to join the carbon exchange.

5. The government needs to make companies aware that reputation and corporate responsibility regarding environmental concerns are mandatory. Companies must realise that participating in the carbon market can improve the company's image as a socially responsible entity, which can attract customers and investors. Therefore, understanding the importance of environmental awareness is not only emphasised to companies through the carbon exchange mechanism, but also provides education to investors to start investing in companies with good environmental performance.

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