

# The Role of Carbon Pricing Policy on Environment, Social, and Governance Performance in Asia Countries

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## ABSTRACT

This study analyses the relationship between countries' regulatory context and Environment, Social, and Governance (ESG) Performance. Little attention has been paid to how carbon pricing policy influences companies' ESG performance. This study used data from 2,600 companies from 11 countries in Asia, both with and without carbon policies, to test whether there was a difference in ESG scores between the two groups of countries. This study found that the ESG score in countries with carbon pricing policies was lower than the ESG in countries without carbon pricing policies. This difference proved to be significant. In the context of this research, the Environment Modernization Theory has not been proven to be able to encourage corporate reporting activities and improve corporate ESG performance. This was the first research considering carbon pricing policy regulations in the study of ESG, especially in Asia.

**Keywords:** *Carbon Pricing, ESG Performance, Ecological Modernization Theory, ESG Scores*

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## **INTRODUCTION**

Carbon pricing is a policy that many countries have implemented in the last decade. Started by Finland and Poland in 1990, this policy has been adopted by many countries to reduce greenhouse gas emissions. A recent High-Level Commission on Carbon Pricing and Competitiveness report found that ‘Carbon pricing is an effective, flexible and low-cost approach to reducing greenhouse gases (GHG)’ (CPLC, 2022). The widespread—and growing—use of carbon pricing reflects confidence in its effectiveness. According to data from World Bank 2022, there were 36 carbon taxes and 32 emission trading schemes (ETS) worldwide.

Carbon pricing is an instrument that captures the external costs of greenhouse gas (GHG) emissions—the costs of emissions paid by the public, such as crop damage, health care costs from heat waves and droughts, and property losses from floods and droughts, sea level rise— and ties it to the source via a price, usually in the form of a price of carbon dioxide (CO<sub>2</sub>) produced. Carbon pricing helps shift the brunt of the damage from GHG emissions back to those responsible and can avoid it; instead of dictating who should reduce emissions, where, and how, carbon prices provide economic signals to emitters and allow them to decide to change their activities and reduce or continue to emit and pay for their emissions.

Several studies have tried to prove the impact of carbon pricing policies on reducing emissions in a country. Some studies proved that carbon pricing policies reduced GHG emissions (Anderson & Di Maria, 2011; Arimura et al., 2021; Bel & Joseph, 2015; Dechezleprêtre et al., 2022). However, several other researchers have proven the opposite results that carbon pricing policies do not have the expected emission reduction impact (Martin et al., 2014; Pretis, 2022; Wakabayashi & Kimura, 2018; Wang et al., 2019). Previous research was generally conducted in European countries but still minimal in Asian countries.

Carbon pricing policies in a country are generally aimed at business people or companies in that country. So, the existence of this policy will undoubtedly affect the company's operational policies related to the ESG. Several studies have discussed the impact of environmental policies on a country's corporate financial disclosure and performance. As Esty and Porter (2005a) suggested, environmental regulations can provide long-term increases in corporate earnings by encouraging them to concentrate on lowering production costs and increasing customer satisfaction and sales. Thus, corporate ecological regulations can be a "win-win" solution for companies and society. Strict environmental regulations generate more competition and motivate efficiency and innovation (Yusof et al., 2020). Companies can increase their profitability through environmental regulations and commitment to environmental issues (Cohen & Tubb, 2018; Huang et al., 2022).

In addition, (Cohen & Tubb, 2018) argued that environmental regulations can encourage increased productivity. The existing literature suggests that pressure exerted through government regulation is a significant driver of corporate environmental action (Hrasky, 2012; Wahyuni & Ratnatunga, 2015).

Many studies have been conducted on company ESG performance, discussing the relationship between ESG performance and company financial performance. Several studies have been recorded, such as in Malaysia (Smith et al., 2007); (Ong et al., 2014). USA (Barnett & Salomon, 2012); Korea (Kim et al., 2013); (Han et al., 2016); Eropa (Wagner & Schaltegger, 2004); Australia (Galbreath, 2013); compare several countries (Sahut & Pasquini-Descomps, 2015; Tarmuji et al., 2016; Aouadi & Marsat, 2018). These studies have proven varying and inconsistent results.

There is an overlooked research gap that may be why the results of these studies are inconsistent. The different research locations between countries were one of the factors that could have caused inconsistency. More specifically, a country's policies, such as carbon pricing, can influence the company's ESG policy. However, little evidence has linked a country's carbon pricing policy with the company's ESG rating.

A country's carbon policy will force companies to implement energy efficiency to avoid paying high carbon taxes. As a result of energy efficiency, the emissions produced will be reduced. Reducing

emissions produced by a company will increase the company's ESG performance. Therefore, the carbon pricing policy implemented in a country will impact the ESG performance of companies.

To address the research gap related to carbon pricing, this research raised the issue of the relationship between carbon pricing policy and corporate ESG performance. This research identified and compared several countries, especially in the Asian region. The carbon pricing policy in a country can be predicted to influence the policies and practices that apply to companies in that country, which will affect the company's ESG performance in that country.

This research will discuss the ESG performance of companies in countries in the Asian region that have carbon pricing policies and those that do not have carbon pricing policies. The data used came from the ESG Book and carbon pricing dashboard.worldbank.org. The ESG Book is a SaaS data management and disclosure platform providing raw ESG data, company-level and portfolio-level scores, ratings, and analytics. Meanwhile, data on countries implementing carbon pricing through the carbon tax mechanism and emissions trading systems (ETS) were obtained from the Carbon Pricing Dashboard.

This research contributes by providing evidence regarding the impact of carbon pricing policies on company ESG performance by comparing ESG performance between countries in the Asian region that applied carbon pricing and those that did not apply carbon pricing. Furthermore, this paper will be presented in several parts. The second part describes the literature review on carbon pricing, ESG, research theories, and hypotheses. The third part describes the research method. The fourth section discusses the analysis and results. The last section discusses the conclusions, limitations, and opportunities for further research.

## **Theory and Literature Review**

### ***Environment, Social, Governance (ESG)***

ESG is a set of codes for a firm's operations that socially and environmentally sensible investors use to screen future investments (Alareeni & Hamdan, 2020). ESG is "the consideration of environmental, social, and governance factors alongside financial factors in the investment decision-making process" (Hübel & Scholz, 2020). ESG is the fundamental corporate sustainability strategy generally prevalent in banking institutions (Miralles-Quirós et al., 2019). Effective strategic decisions to inject resources and capital to improve and achieve the commitments about ESG help banks gain a sound financial position and upsurge customer loyalty (Buallay, 2019; Buallay & Al-Ajmi, 2020; Shakil et al., 2020). Any negligence on ESG may harm the company's goodwill and question long-term sustainability.

ESG disclosure covers a broad spectrum of sustainability-related aspects not normally captured in traditional investment reporting and analysis. Voluntary disclosure at the time of listing can improve the quality of corporate information, reduce information asymmetry in firm value, and signal compliance with societal norms concerning sustainable business conduct, which is assumed to lead to increased legitimacy and reduced idiosyncratic risks.

Often, carbon-related policies cause changes in the internal and external aspects of carbon accounting because laws will make companies more accountable for their carbon emissions (Larrinaga, 2014); (Linnenluecke & Griffiths, 2010). Bui and de Villiers (2017) found that New Zealand power plants were adapting carbon management accounting as a strategic response to changing climate change regulations in New Zealand.

Determination of carbon pricing is an instrument that captures the external costs of greenhouse gas (GHG) emissions—emission costs borne by the public, such as damage to crops, health care costs due to heat waves and droughts, and property losses due to floods and droughts (Green, 2021). Sea-level rise—and tying it to its source through a price, usually in the form of a generated carbon dioxide (CO<sub>2</sub>) price. A country can implement two carbon pricing policies: the Emission Trading System (ETS) and the Carbon tax.

An emissions trading system (ETS) is where emitters can trade emission units to meet their targets (Chen et al., 2022). To meet their emission targets at minimal cost, regulated entities can apply internal abatement measures or acquire emission units on carbon markets, depending on the relative cost of these options. By creating supply and demand for emission units, ETS sets market prices for GHG emissions.

Carbon taxes directly set a price for carbon by setting an explicit tax rate on GHG emissions or—more generally—on the carbon content of fossil fuels, i.e., the cost per tCO<sub>2</sub>e. It differs from ETS in that the resulting reduction in emissions from a carbon tax is not predetermined but the carbon price.

The Asian region plays a central role in meeting the goals of the Paris Agreement and achieving net-zero greenhouse gas emissions by 2050. Home to some of the largest global carbon emitters and a major developing economy, the region is also one of the most vulnerable to the impacts of climate change. This is further complicated because more than 60% of the world's population lives in this region.

Carbon pricing is a flexible and cost-effective tool that can send a price signal to governments and the private sector to move away from high-carbon-emitting activities. Since 2010, Asian governments have increasingly taken an interest in carbon pricing by imposing carbon pricing or intending to do so according to their NDCs (Steckel et al., 2021). Singapore implemented a carbon tax in January 2019. There are eight pilot ETSs in the Chinese province, two in the Japanese provinces of Tokyo and Saitama, and Korea has a national ETS.

This way, the overall environmental goals were achieved in the most flexible and least costly way for society. Placing a reasonable price on GHG emissions is relevant for internalizing the external costs of climate change over the broadest possible range of economic decision-making and establishing economic incentives for clean development (Trinks et al., 2022). This can help mobilize the financial investments needed to stimulate clean technology and market innovation, driving new, low-carbon economic growth drivers.

### ***Ecological Modernization Theory***

Ecological modernization (EM) emerged in the early 1980s as a theoretical approach to describe the relationship between economics and innovation, nation-state intervention, and NSA involvement in decision-making to achieve desired environmental outcomes (Spaargaren & Mol, 1992). Some theorists have also advocated ecological awareness as a necessary element in EM models, a shift from implicit to explicit influence on the attainment of outcomes (Buttel, 2000; York & Rosa, 2003). EM is increasingly used in environmental policy analysis (McGee, 2010; Weber & Weber, 2020) because EM provides a suitable framework for exploring the role of actors in society in processes toward achieving best-practice environmental outcomes. EM argues that the relationship between economic activity, technological innovation, and the intervention of nation-states and civil society is necessary to attain best-practice environmental outcomes.

Huber (2000) emphasized the state's role in EM, advocating that the legal basis of environmental policy and regulation by authorities is necessary and provides the necessary stability factor for business decision-making processes to innovate. He argued that the nation-state is an essential counterweight to unfettered market behavior and that its role as an active regulator is the basis for effective environmental policies. Huber's view was supported by others (Weber & Weber, 2020).

Stern (2007) argued that effective climate change adaptation may require governments to address specific market failures and constraints. As stated by Esty and Porter (2005a), companies alone will not implement the strategies necessary to deliver environmental outcomes without regulatory encouragement. They found that environmental outcomes were a function of economic development and a consequence of policy choices. They concluded from their research that, among other things, regulatory tightening and regulatory structures were critical to achieving environmental performance.

This research used the Ecological Modernization Theory as a frame of reference. Central to the Ecological Modernization Theory is the idea that environmental problems can be addressed and solved through production transformations (Murphy & Gouldson, 2000) and that government regulatory efforts are one of the main driving factors (Mol et al., 2014; Mol, 1999). Advocates of the Theory are optimistic that continued growth and modernization can lead to a revival of ecological rationality, in which

“environmental concerns” are increasingly included in private sector decision-making (Porter & Linde, 1995). According to the Theory eco-tax is one of the instruments in environmental reform (Mol et al., 2014).

The existence of standards in environmental regulations is considered to encourage innovation (Porter & Linde, 1995) and increase economic competitiveness (Jänicke, 2008; Esty & Porter, 2005b). Supporters of the Ecological Modernization Theory also suggested that companies have legal, economic, and social reasons to be 'green' (Huber, 2000) under more advanced systems of environmental regulation. In linking the idea of the Ecological Modernization Theory with debates around disclosure, this research questioned whether more progressive environmental policies in a country, such as carbon pricing, will encourage corporate reporting activities and improve corporate ESG performance.

Several studies have identified a link between a company's ESG performance and the regulations in the country in which the company originates. Adopting emissions trading policies and systems by companies signifies a company's willingness to formulate a carbon emission strategy, implement it, and ultimately disclose it. (Hossain & Farooque, 2019). Adopting emission trading policies and systems is an essential signal of a company's willingness to participate in strategic decisions about carbon emissions.

Research on the relationship between regulations in a country and voluntary disclosure / corporate carbon in that country has been carried out by many researchers, including: (Grauel & Gotthardt 2016, Hossain & Farooque, 2019 Liu et al., 2017 Mateo-Márquez et al. 2020; Amran et al., 2016).

Grauel and Gotthardt (2016), researching carbon disclosure on listed companies in Germany, found that environmental regulations and country of origin were significant explanatory factors in determining company carbon disclosures. The characteristics of the national context strongly influenced participation in carbon disclosure by listed companies. The level of response to CDP's climate change program differed significantly between countries globally.

Research by Liu et al. (2017) in the context of the National Greenhouse Energy Act 2007 (National Greenhouse and Energy Reporting Scheme (NGERS) and the Clean Energy Act 2011 (Carbon Tax) in Australia found that the implementation of NGERS had a positive effect on voluntary disclosure of climate change by GOCs. Disclosure mandates an organization's negative environmental performance, such as greenhouse gas emissions, can influence voluntary disclosure of related information, especially in organizations not subject to capital market incentives.

Furthermore Mateo-Márquez et al. (2020) analyzed the relationship between the state regulatory context and voluntary carbon disclosure. The results showed that country-specific climate change regulations influenced a company's participation in the CDP and its quality, as measured by the CDP's disclosure score.

Matten and Moon (2008) explained the differences in Corporate Social Responsibility (CSR) in the United States and Europe. The European type of 'implicit' CSR implies that the company complies with customary laws and ethics and that these responsibilities reflect mandatory or standard requirements. In contrast, US 'explicit' CSR means that companies voluntarily assume and articulate responsibilities for the benefit of society. They argued that CSR is embedded both in national institutional settings and in the field of international organizations.

Research by Amran et al. (2016) on the influence of internal resources and regional geographical influences on climate change business strategies found that the home and host country affected ASEAN climate change business strategies at different levels. (Hossain & Farooque, 2019). They researched 500 companies in 32 countries and found that the emission trading system positively affected carbon disclosure by companies in that country. The CDP score measures carbon disclosure. Similarly, Dowell et al. (2000) found that the relationship between strict environmental disclosure commitments and financial performance was positive. This aligns with Saleh et al. (2011), which showed a positive relationship between EVN and FP.

Research by Tang et al. (2022) revealed that CET policies can increase the market value of listed companies by influencing carbon prices, innovative activities, and carbon disclosure. Flora and Vargiolu (2020) asserted that the carbon price stability mechanism in the European Union (EU) ETS significantly

influenced the timing of investment decisions and helped reduce investment-related carbon emissions. Anwar et al. (2021) examined the relationship between institutional pressure on national carbon pricing policies and voluntary environmental disclosures (VED) from power generation companies. They found that implementing carbon pricing policies at the national level significantly increased the quantity of VED.

These studies proved that policies related to sustainability implemented in a country will impact the company's business strategy. The carbon pricing policy is one of the policies implemented by various countries worldwide, including Asia. The ESG score is formed from ESG performance scores. So, it is necessary to identify which performance provides the primary support for ESG performance. Apart from that, analyzing this performance separately will provide a more detailed picture of the impact of the carbon pricing policy. For this reason, this study developed the following hypotheses:

- Hypothesis 1: There is a difference between the ESG performance of companies in countries with carbon pricing policies and countries that do not have carbon pricing policies.*
- Hypothesis 2: There are differences between companies' environmental performance in countries with carbon pricing policies and countries that do not have carbon pricing policies.*
- Hypothesis 3: There are differences between companies' social performance in countries with carbon pricing policies and countries that do not have carbon pricing policies.*
- Hypothesis 4: There are differences between the performance of corporate governance in countries that have carbon pricing policies and countries that do not have carbon pricing policies.*

## METHODOLOGY

This study aimed to analyze differences in company ESG performance in countries in the Asian region that implemented carbon pricing policies and those that did not. Data regarding company ESG performance was obtained from the website <https://app.esgbook.com>, which provides company ESG data worldwide. ESG Book is a global leader in data and sustainability technologies. There were approximately 100,647 companies around the world whose ESG score data is recorded in the ESGBook. This research was limited to companies originating from countries in the Asian region. As of July 2022, 2651 companies originated from ASIA and had ESG score data. Out of 2651, 51 companies did not have complete data. So, the companies that had complete data were 2600.

**Table 1: Country of Origin of Companies with ESG Data**

No	Country	Company	Percentage
1	China	834	32.1%
2	Hongkong	176	6.8%
3	India	171	6.6%
4	Indonesia	49	1.9%
5	Jepang	568	21.8%
6	Korea	144	5.5%
7	Malaysia	261	10.0%
8	Philipine	27	1.0%
9	Singapore	88	3.4%
10	Taiwan	154	5.9%
11	Thailand	128	4.9%
	Total	2,600	100.0%

Source: Data processed from <https://app.esgbook.com>

Meanwhile, data on countries that had and had not implemented carbon pricing policies were obtained from the World Bank website. Until now, there were 68 carbon pricing policies that 46 countries in the world had implemented. Some countries applied more than one carbon pricing policy. Of the 68 policies, there were emissions trading systems (ETS) and carbon trading policies. This research did not distinguish between the types of carbon pricing policies a country had adopted, either ETS or carbon trading.

Of the 11 countries in the Asian Region, five countries had implemented carbon pricing policies, while six other countries had not.

**Table 2: Carbon Pricing Policy in Asian Countries**

No	Country	Carbon Pricing
1	China	1
2	Hongkong	0
3	India	0
4	Indonesia	0
5	Jepang	1
6	Korea	1
7	Malaysia	0
8	Philippine	0
9	Singapore	1
10	Taiwan	1
11	Thailand	0

**Table 3: Number of samples in Carbon Policy Country and Non-Carbon Policy Country**

No	Carbon Pricing	Sample	Percentage
1	China	834	46.6%
2	Jepang	568	31.8%
3	Korea	144	8.1%
4	Singapore	88	4.9%
5	Taiwan	154	8.6%
<b>Total</b>		<b>1,788</b>	<b>100.0%</b>
No	Non-Carbon Pricing	Sample	Percentage
1	Hongkong	176	21.7%
2	India	171	21.1%
3	Indonesia	49	6.0%
4	Malaysia	261	32.1%
5	Philippine	27	3.3%
6	Thailand	128	15.8%
<b>Total</b>		<b>812</b>	<b>100.0%</b>

Table 2 shows the number of sample companies in each country in the Carbon Policy Country and non-Carbon Policy Country groups.

To test whether there was a difference between the ESG performance of companies in countries with carbon pricing policies and those that did not, this study used an independent t-test. The Independent T-test is a comparative or different test to determine whether there is a significant difference in the mean or average between 2 independent groups with interval/ratio data scales. This test can be carried out because the data must come from different groups, the data type is numeric, the data interval or ratio scale and the data is usually distributed. The variance between the two sample groups must be the same.

## RESULTS AND DISCUSSION

ESG scores from two groups of countries, namely countries that applied carbon pricing and countries that did not were evaluated and compared as shown in the following Table. ESG scores of sample companies in countries with carbon pricing policies are described in Table 4. Meanwhile, ESG scores in countries without carbon pricing policies are shown in Table 5.

**Table 4: ESG scores of companies in Carbon Pricing countries**

No	Carbon Pricing	ESG Score	ESG - Env	ESG - Gov	ESG - Social
1	China	48.65	49.60	46.71	49.94
2	Jepang	53.36	59.63	47.45	55.32
3	Korea	50.91	57.54	44.83	53.43
4	Singapore	53.27	54.31	50.78	56.24
5	Taiwan	57.35	65.04	49.38	60.25
	Mean	52.71	57.22*	47.83	55.04

### *China*

The average ESG score for companies in China was 48.65, with the highest score for ESG Social, which was 49.94. The lowest ESG score in China was the Governance ESG score, 46.71.

### *Japan*

The average ESG score for companies in Japan was 53.36. For companies in Japan, the ESG environment had the highest score, namely 59.63, while the lowest ESG score was ESG governance, which was 47.45.

### *Korea*

At companies in Korea, the average ESG score was 50.91. Like Japan, Korean companies also had the highest environmental ESG score of 57.54. Meanwhile, the governance ESG score was only 44.83.

### *Singapore*

The average ESG score of companies in Singapore. For companies in Singapore, the Social ESG Score had the highest score of 56.24 compared to environmental and governance ESG.

### *Taiwan*

Of the six countries that applied carbon pricing, companies in Korea had the highest ESG score (57.35). Environmental ESG had the highest score of 65.04, followed by Social ESG at 60.25 and Governance ESG at 49.34.

In countries with carbon pricing, companies in Korea had the highest ESG environmental and social scores. At the same time, ESG governance was the highest in Singapore. In addition, the Environmental ESG score was the highest in carbon-pricing countries compared to governance ESG and social ESG.

**Table 5: ESG scores of companies in Non-Carbon Pricing countries**

No	Non-Carbon Pricing	ESG Score	ESG - Env	ESG - Gov	ESG - Social
1	Hongkong	53.11	61.06	45.00	57.57
2	India	57.35	61.92*	53.69	58.72
3	Indonesia	57.72*	59.60	55.13*	60.39*
4	Malaysia	55.40	56.78	51.38	59.93
5	Philipine	52.92	59.90	44.37	57.85
6	Thailand	54.81	57.00	50.00	59.76
	Average	55.22	59.38*	49.93	59.04



*Hong Kong*

The average ESG score for companies in Hong Kong was 53.11. The companies had the highest environmental ESG score compared to governance and social ESG scores.

*India*

Companies in India had an average ESG score higher than Hong Kong, which was 57.35. The environmental ESG score had the highest score (61.92) compared to social ESG and governance ESG.

*Indonesia*

The average ESG score of companies in Indonesia was 57.72. This figure was the highest compared to all non-carbon pricing countries. The highest score was ESG Social, 60.39, while the lowest was ESG Governance, 55.13.

*Malaysia*

Companies in Malaysia had an average ESG score of 55.4. The social ESG score was the highest compared to environmental ESG and governance ESG scores for companies in that country.

*Philippine*

Companies in the Philippines had the lowest ESG score of 52.92 compared to other non-carbon pricing countries. Like companies in India, companies in the Philippines had the highest environmental ESG scores compared to other ESG scores.

*Thailand*

The average ESG score of companies in Thailand was 54.81. In Thailand, companies' social ESG scores were higher (59.76) than environmental ESG and governance ESG.

In non-carbon pricing countries, the average ESG score was 55.22. The highest ESG score was in environmental ESG, 59.38, followed by social ESG, 49.93, and governance ESG, 59.04.

Subsequent analysis showed the ESG scores by sector in the two groups of countries. Sustainalytics data divided companies into twenty industries.

**Table 6: ESG Score by Company Sector**

No	Sectors	ESG Score	
		Carbon Policy	Non-Carbon Policy
1	Commercial Services	48.26	54.75
2	Communications	55.63	54.50
3	Consumer Durables	54.42	59.19
4	Consumer Non-Durables	54.37	60.59
5	Consumer Services	51.16	53.17
6	Distribution Services	51.29	54.26
7	Electronic Technology	54.02	60.71*
8	Energy Minerals	55.99*	57.26
9	Finance	47.02	52.91
10	Health Services	47.81	54.18
11	Health Technology	49.20	53.78
12	Industrial Services	51.90	54.74
13	Miscellaneous	42.25	46.50
14	Non-Energy Minerals	53.02	56.54
15	Process Industries	52.69	56.17
16	Producer Manufacturing	54.47	57.18
17	Retail Trade	50.00	54.62
18	Technology Services	47.59	54.21
19	Transportation	51.13	55.13
20	Utilities	50.60	55.67

In the Carbon Policy Country group, the highest ESG score was in the Energy sector, namely 55.9, followed by the communications sector (55.63) and producer manufacturing (54.47). Meanwhile, in the Non-Carbon Policy group, the Electronic Technology sector had the highest ESG score (60.71), followed by the Consumer Non-Durables sector (60.59) and Consumer Durables (59.19). In the two groups of countries, the financial industry had the second smallest ESG score after the Miscellaneous sector.

**Table 7: Differences in ESG Scores in Carbon Pricing and Non-Carbon Pricing Countries**

Country	Carbon Pricing	Non-Carbon Pricing
ESG Score	52.71	55.22
ESG - Env	57.22	59.38
ESG - Gov	47.83	49.93
ESG - Social	55.04	59.04

Furthermore, ESG scores based on the two groups of countries were compared. As shown in Table 7 shows the ESG score in countries with carbon pricing was lower (52.71) compared to non-carbon pricing countries (55.22). Environmental, governance, and social scores also followed this. All ESG scores in carbon-pricing countries were lower than in non-carbon-pricing countries. This indicated that the ESG performance of companies in carbon-pricing countries was not better than companies in non-carbon-pricing countries.

**Table 8. ESG score on Carbon Pricing Country and Non-Carbon Pricing: A Comparison**

	Carbon Pricing	Non-Carbon Pricing
Sample	1.788	812
Mean ESG Score	52.71	55.22
Mean ESG - Env	57.22	59.38
Mean ESG - Gov	47.83	49.93
Mean ESG - Social	55.04	59.04
Category with highest ESG-Score	ESG- Environmental	ESG- Environmental
Category with lowest ESG-Score	ESG - Governance	ESG - Governance
The industry has the highest ESG score.	Energy Minerals	Electronic Technology
The industry with the lowest ESG-Score	Finance	Finance

Furthermore, the differences between countries with carbon and non-carbon pricing were compared. As shown in Table 8 the average ESG score in non-carbon-pricing countries was higher than in carbon-pricing countries. This indicated that companies in countries that did not have a carbon pricing policy tended to disclose more about their sustainability performance. The same was also seen in each disclosed ESG component. In both groups of ESG-environment countries, the ESG-Score was the highest. This indicated that, both regulated and unregulated, all companies agreed that the environment was an essential thing that must be considered in sustainability performance. Meanwhile, ESG-Governance is the ESG with the lowest score in the two groups of countries. The mineral energy sector had the highest ESG score in countries with carbon pricing. The electronic technology sector had the highest ESG score in non-carbon pricing countries. What was interesting was that the financial sector was the sector with the lowest ESG score in both groups of countries. As described in Table 8, there were some differences between the two groups of countries. To prove whether this difference was statistically significant, an independent t-test was performed. The results of the t-test are shown in Table 9 and Table 10.

**Table 9: Differences in Means in the Two Groups of Countries**

	Carbon Policy	N	Mean	Std. Deviation	Std. Error Mean
ESG Score	Carbon Pricing	1,788	51.3037	9.03388	.21364
	Non-Carbon Pricing	812	55.2736	8.44976	.29653

As shown in Table 9, the average ESG score in the group of non-carbon-pricing countries was higher than that in the group of carbon-pricing countries.

**Table 10: Result of Independent Sample T-Test**

		F	Sig.	t	Sig. (2-tailed)	Mean Difference	Std. Error Difference
ESG Score	Equal variances assumed	7.282	.007	-10.593	.000	-3.96985	.37475
	Equal variances not assumed.			-10.862	.000	-3.96985	.36548

The independent t-test analysis results showed a significant difference at the 1 percent level between the ESG scores of companies in carbon-pricing countries and non-carbon-pricing countries. The independent t-test showed that companies in countries without carbon-pricing policies had higher ESG scores than countries with carbon-pricing policies. There may be many reasons for this finding. First, companies in non-carbon pricing countries felt the need to take place internationally because their own countries did not yet have a policy related to carbon pricing. In contrast, this issue has become an international issue. They tried to legitimize themselves in the global world. This finding aligned with Bhatia and Tuli (2018), who found that corporate sustainability practices in developed countries were lower than those in developing countries. Some countries that applied carbon pricing in this context included China and Japan, which were considered advanced based on World Bank data. Second, showing good ESG performance for companies in non-carbon pricing countries helped demonstrate performance to stakeholders and helped to get better access to capital. This finding aligned with Farisyi et al. (2022), which found that sustainability disclosure in developing countries was better than in developed countries. Countries not implementing carbon-pricing policies in this study were all developing countries. Besides that, the lower ESG score in countries with carbon pricing policies aligned with Dussaux, (2020) in France that the existence of a carbon pricing policy can only reduce 1 percent of emissions from companies. This indicated that companies did not appreciate the carbon pricing policy by increasing their ESG performance.

**Table 11: The description on ESG\_Env, ESG Gov, and ESG Social from Carbon Pricing and non-carbon Pricing Country**

	Carbon Policy	N	Mean	Std. Deviation	Std. Error Mean
ESG_Environment	Carbon Pricing	1,788	54.9895	13.82147	.32687
	non-Carbon Pricing	812	59.0828	10.65473	.37391
ESG_Governance	Carbon Pricing	1,788	47.2234	15.22047	.35995
	non-Carbon Pricing	812	50.2602	15.51664	.54453
ESG_Social	Carbon Pricing	1,788	53.1303	9.80614	.23191
	non-Carbon Pricing	812	59.0904	7.70521	.27040

Then, an analysis was conducted to identify differences in each ESG component: environmental ESG, governance ESG, and social ESG. The data above showed that the value of each ESG in non-carbon-pricing countries was higher than in carbon-pricing countries. Furthermore, an ANOVA test was carried out to determine whether there was a significant difference between each ESG score based on carbon pricing policies. The results of the ANOVA test showed that the scores were environmental\_ESG ( $F = 3.255$ ;  $p\text{-value} = 0.035 < 0.05$ ), governance ESG ( $F = 3.935$ ;  $p\text{-value} = 0.018 < 0.05$ ), and social ESG ( $F = 3.42$ ;  $p\text{-value} = 0.021 < 0.05$ ) was influenced by the presence or absence of a carbon pricing policy in that country. There were significant differences in both the ESG score and the ESG per dimension in the two groups of countries. This indicated that this difference was due to the presence of carbon policies. These findings were consistent with research by Green (2021); Hossain & Farooque (2019). However, the results obtained did not support the initial assumption of the research as the view of Ecological Modernization Theory.

Next, Table 12 shows the results of a simple regression analysis to prove the influence of carbon policy on ESG scores.

**Table 12: Simple Regression Analysis**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	55.274	.311		177.858	.000
	Carbon Policy	-3.970	.375	-.203	-10.593	.000
a. Dependent Variable: ESG Score						
R	R Square	Adjusted R Square		Std. Error of the Estimate		
.203 <sup>a</sup>	.041	.041		8.85568		

As shown in Table 12, carbon policy influenced the ESG score significantly ( $p < 0.005$ ). This proved that a country's carbon policy will positively affect the ESG score of companies in that country. The results of this test supported the previous test. An Adjusted R square value of 0.041 showed that the influence of carbon policy on the ESG score was 0.041. This finding was in line with (Dominioni, 2022; Khan & Johansson, 2022), which proved that carbon policy is an instrument for reducing company emissions and improving company ESG performance.

## CONCLUSION

Many studies have discussed the influence of ESG on company financial performance, but they have had inconsistent results. However, very little research had explored a company's ESG performance regarding carbon policies in a country. This study discussed the impact of carbon pricing policies in Asian countries by comparing the ESG scores of companies in countries with carbon pricing and non-carbon pricing policies. This research found that all ESG scores in carbon-pricing countries were lower than in non-carbon-pricing countries. This indicated that the ESG performance of companies in carbon-pricing countries was not better than companies in non-carbon-pricing countries. In countries with carbon pricing, companies in Korea had the highest ESG scores and environmental and social ESG. At the same time, ESG governance was the highest in Singapore. In addition, the Environmental ESG score was the highest in carbon-pricing countries compared to governance ESG and social ESG. In non-carbon pricing countries, the average ESG score was 55.22. The highest ESG score was in environmental ESG, 59.38, followed by social ESG, 49.93, and governance ESG, 59.04. This research also proved that a carbon pricing policy positively affected the ESG performance of companies in that country. This at least provided good news for countries that have implemented carbon pricing policies.

There were several reasons why, in this study, the ESG score in countries with carbon pricing policies was lower than the ESG score in countries without carbon pricing policies. First, this study did

not distinguish between the types of carbon pricing applied, whether a carbon tax or ETS. Second, this study also did not differentiate at which level these policies were enforced, whether national or regional. Third, this study also did not distinguish when the policy was implemented. Another opinion, as conveyed by Green (2021), was that carbon pricing was not high enough to motivate companies to improve their ESG performance. Most carbon prices were far below even the most conservative estimates of the 'social cost of carbon' (SCC) (Green, 2021). So that all of these things can have an impact on research results. For this reason, further research is expected to explore these matters more deeply.

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