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The Implementation and Impacts of Carbon Tax Globally: A Systematic Literature Review

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Abstract. This study aims to analyze variations in carbon tax implementation across countries, as well as its impacts on corporate financial performance and decarbonization effectiveness. The study employs a Systematic Literature Review (SLR) method based on the PRISMA guidelines, analyzing 15 Scopus-indexed articles. The findings indicate that carbon tax implementation varies in terms of tax rates, sectoral coverage, and mechanisms for allocating tax revenues. Its impacts on corporate financial performance are heterogeneous, while decarbonization effectiveness is influenced by policy design, sectoral characteristics, and complementary policies. This study concludes that the success of carbon taxation is determined not only by the tax rate but also by the appropriateness of policy design and its ability to encourage actual emission reductions without disregarding companies' economic conditions.

Keywords: Carbon pricing; Decarbonization; Financial performance; Carbon tax; SLR

1. Introduction

Global warming caused by the accumulation of greenhouse gas (GHG) emissions has reached a critical point, with the global average temperature in 2024 reaching 1.55°C above pre-industrial levels and CO_2 emissions hitting a record 38.6 billion tonnes (WMO, 2025; Global Carbon Budget, 2025). Although China, the United States, India, Japan, and Indonesia are collectively the largest contributors to fossil fuel emissions (Global Carbon Budget, 2025), as illustrated in Figure 1, the International Energy Agency (IEA, 2025) reported that in 2024, emissions in developing countries (China, India, and Indonesia) continued to increase by approximately 1.5% due to high coal and natural gas consumption to support economic expansion. In contrast, emissions in developed countries (the United States, the European Union, and Japan) declined by approximately 1.1%. This situation demonstrates that the

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target of achieving net-zero emissions by 2050 under the Paris Agreement remains unmet. Voluntary Nationally Determined Contributions (NDCs) commitments project that emissions will still reach 55 gigatonnes by 2030, far exceeding the safe threshold of 40 gigatonnes, with only an approximately 11% reduction achieved against the target reduction range of 25%–50% [1, 2].

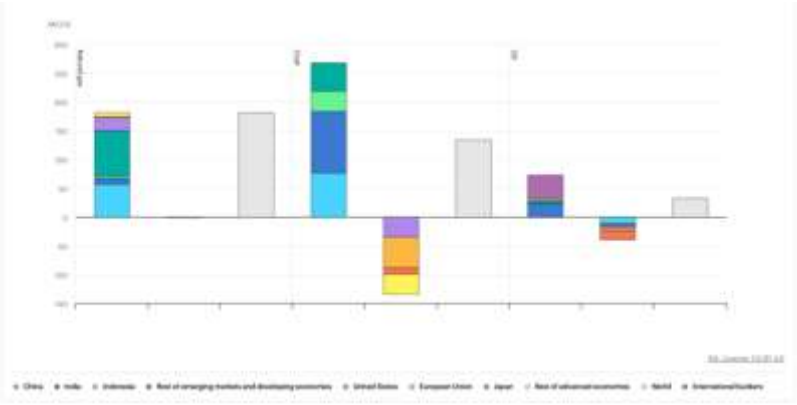


Figure 1. Changes in Global Emissions by Fuel Type and Region in 2024
Source: IEA, 2025.

The failure to achieve the zero-carbon target has encouraged countries to implement carbon taxes, which are direct monetary levies imposed on the carbon content of fossil fuels or per tonne of carbon dioxide equivalent (tCO_2e) emissions. Carbon taxes offer greater price certainty and administrative simplicity compared to emissions trading systems [3, 4]

Theoretically, carbon tax policy is rooted in the Pigouvian Tax theory (Pigou, 1920), which views taxation as an instrument for correcting market failure caused by the negative externalities of pollution. Through the polluter pays principle, carbon taxes incorporate the social costs of environmental damage into companies' production costs, thereby encouraging the transition to clean energy [2]. In practice, global carbon tax implementation has expanded to more than 75 jurisdictions, with policy schemes varying in terms of tax rates, sectoral coverage, and revenue recycling mechanisms [2, 23]. Developed European countries impose relatively high tax rates, such as Liechtenstein (US$150/$tCO_2e$), Sweden (US$130/tCO_2e), Switzerland (US$100–111/$tCO_2e$), Finland (US$60–85/tCO_2e), and Denmark (US$116/$tCO_2e$). These taxes are combined with the EU Emissions Trading System (EU ETS) and the Carbon Border Adjustment Mechanism (CBAM) to prevent carbon leakage [2, 5 ,6]. Canada has adopted a federal backstop scheme accompanied by the redistribution of tax revenues to the public (revenue recycling), while the United States primarily relies on green subsidies and incentives through the Inflation Reduction Act (IRA) [7, 5]. In contrast, developing countries such as China and Indonesia have adopted emissions trading systems (ETS) in certain sectors while continuing to assess carbon tax policies to avoid hindering economic development [8, 5].

These variations in carbon tax schemes across countries have direct implications for global decarbonization, business operations, and corporate financial performance [9]. In addition to effectively reducing emissions in developed countries [10 ,11], carbon taxes alter supply chain cost structures and stimulate investment in green innovation [2, 12]. However, their impacts on corporate financial performance have produced mixed findings. On the one hand, Luo dan Tang (2014) and Brouwers et al. (2018) demonstrate that carbon taxes generate substantial cash outflows and increase marginal costs, thereby reducing profitability and

market value when companies are unable to pass these costs on to consumers. On the other hand, Wedari et al. (2024) and Huang et al. (2026) find that companies can maintain positive financial performance through government compensation, carbon credit allocations, green innovation efficiency, and ESG reputation.

The interest in examining this topic arises from two critical issues in the development of carbon tax literature. First, despite the extensive body of literature on carbon taxes, most studies remain dominated by ex-ante research focusing on policy simulations, scenario projections, or mathematical modelling, such as Computable General Equilibrium (CGE) models, to project the achievement of net-zero emissions targets [10, 2, 13]. Consequently, studies that specifically map empirical (ex-post) evidence on the actual implementation of carbon taxes, including the details of actual tax rates and policy schemes adopted in individual countries, remain limited. Second, considering that research on carbon tax policy implementation has been conducted since the early 1990s, particularly in Scandinavian countries, and has continued to expand substantially to the present day [10, 2] there is an urgent need to reassess the progress of policy implementation in recent years. This includes examining the extent to which carbon taxes have effectively encouraged decarbonization and their actual impacts on corporate financial performance.

These two fundamental issues highlight the importance of collecting and synthesizing empirical evidence from previous studies to provide a comprehensive overview of carbon tax implementation across countries and its actual implications after decades of policy development. Without a comprehensive mapping of the actual tax rates and policy schemes implemented across various jurisdictions, along with an evaluation of their effectiveness in reducing emissions and their implications for corporate financial conditions, policymakers and business practitioners will lack empirical benchmarks for formulating future low-carbon transition strategies. Therefore, this study employs a Systematic Literature Review (SLR) approach, examining 15 selected Scopus-indexed articles to address these issues in depth.

2. Research Method

This study employs a Systematic Literature Review (SLR) method based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Liberati et al., 2009), examining 15 Scopus-indexed articles (Q1–Q4) to ensure methodological rigor and the replicability of findings. This study focuses on the following two research questions:

RQ 1. How do carbon tax implementation schemes vary across countries?
RQ 2. What are the impacts of carbon taxes on corporate financial performance and global decarbonization effectiveness?

2.1. Literature Search

As the primary inclusion criteria, the literature search focused on the quality and relevance of topics related to the implementation and impact of carbon taxes, using the Scopus database. The search, conducted on November 2, 2026, was not limited to a specific time frame in order to capture both the overall historical evolution and current trends of these topics. The keywords were specifically designed by combining various terms related to carbon tax regulations, their impact on the economy and decarbonization, and their impact on financial performance into a single search string using Boolean operators (AND and OR), namely

"Carbon Tax" OR "Carbon Taxation" OR "CO2" AND "Implementation" OR "Tax Design" OR "Impact" OR "Regulation" OR "Policy" AND "Carbon Emission" OR "Emission Reduction" AND "Financial Performance" OR "Economic Impact" OR "Economic Effect" OR "Firm Performance" OR "Profitability". By searching the

Scopus database using that set of keywords, we were able to compile an initial set of search results totaling 1,268 articles.

2.2. Eligibility and Article Selection Criteria

Of the 1,268 articles identified, a systematic, multi-stage screening process was conducted to ensure the methodological quality and substantive relevance of the literature, as illustrated in Figure 2. During the initial screening phase using the Scopus database, the scope of the literature was focused on the subject areas of Economics, Econometrics, Finance, Business, Management, and Accounting (310 articles), limited exclusively to journal articles (281 articles), in English (279 articles), that had reached the final publication stage (264 articles), and that were Open Access to ensure transparency in data extraction, resulting in a final selection of 85 articles.

All 85 articles were subsequently deemed eligible because they were free of duplicate data and verified as originating from reputable journals indexed in Scopus (Q1–Q4). During the document retrieval phase, 63 articles were obtained in full-text format. In the final phase, a substantive feasibility test was conducted on the 63 articles, resulting in 15 final articles that were included in the in-depth synthesis.

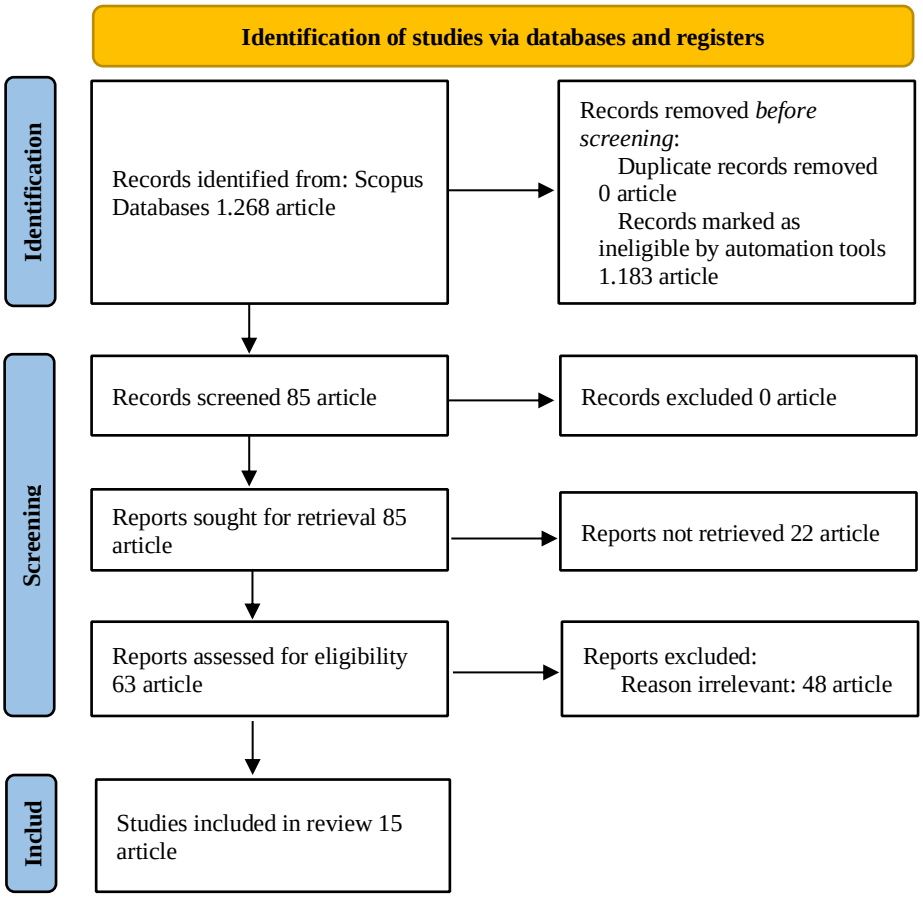


Figure 2. PRISMA Selection Flowchart (Source: adapted by the author from Liberati et al. 2009)

2.3. Content Analysis

Content analysis was conducted on the 15 final articles that had been selected to identify patterns and the meaning of the messages in each article. Given the degree of subjectivity involved in this process, data extraction was carried out meticulously into a mapping matrix that included the author's identity, the Scopus journal quartile (Q1–Q4), the theoretical lens used, the country or regional context of the research, the research methods, and the main findings related to carbon tax schemes and designs, as well as their significance for corporate financial performance and the effectiveness of decarbonization.

3. Discussion

3.1. Characteristics of the Analyzed Literature Review and Bibliometric Mapping of 15 Articles

This Systematic Literature Review provides an in-depth analysis of 15 scientific articles indexed in Scopus (Q1–Q4). These articles represent the cutting edge of the literature on environmental economics and global carbon taxation in the post-Paris Agreement era. An evaluation of this data provides a comprehensive overview of how carbon-price-based fiscal instruments are studied, modeled, and empirically evaluated across various regions of the world.

3.1.1. Geographic Distribution and Study Methodology

Based on the results of the analysis of the 15 selected articles, the literature on the implementation and impacts of carbon taxes covers a diverse range of jurisdictions, methodological approaches, and sectoral focuses. In general, the literature map is divided into three main geographic clusters (Developed Countries, Developing Countries, and Major Asia-Pacific Economies) and four complementary methodological approaches ranging from post-implementation (ex-post) empirical testing to policy modeling (ex-ante). A summary of the geographic distribution, methodologies, and research focus of these 15 articles is presented in a structured format in Table 1.

Table 1. Mapping of Geographic Distribution, Methodology, and Sectoral Focus of the Study

Mapping Dimension	Category / Cluster	Geographic Scope / Methods & Focus of Analysis	Citations of Related Articles
Geographic Distribution	Developed Countries (*Early Adopters*)	Uni Eropa (Swedia, Finlandia, Denmark, Prancis, Irlandia, Portugal, Slovenia, dll.), Britania Raya, Swiss, Kanada, and Australia	Carattini et al. (2017); Oderinwale & van der Weijde (2017); Gurtu et al. (2022); Wood (2022); Chakraborty et al. (2023); Köppl & Schratzenstaller (2023); Rotar (2023); Wedari et al. (2024); Saramas et al. (2026); Zukauskiene & Snieska (2026)

Mapping Dimension	Category / Cluster	Geographic Scope / Methods & Focus of Analysis	Citations of Related Articles
	Developing Countries & Asia-Pacific	Tiongkok, Vietnam, India, Indonesia, ASEAN member countries	Gurtu et al. (2022); Kamil et al. (2023); Sulistiawati & Buana (2023); Kusumawati et al. (2025); Sing et al. (2025); Wuri et al. (2025)
Methodological Approach	Dynamic Quantitative Econometrics (*Ex-Post* / Panel Data)	*System Generalized Method of Moments*, *Fixed Effects*, *Dynamic Common Correlated Effects*, dan *Granger Causality* to assess the actual impact on financial performance GDP per capita, CO2 emissions, and employment.	Gurtu et al. (2022); Chakraborty et al. (2023); Rotar (2023); Wedari et al. (2024); Saramas et al. (2026); Zukauskiene & Snieska (2026)
	General Equilibrium & Input-Output Modeling	*Computable General Equilibrium* (CGE / GTAP-E), *Interregional Input-Output* (IRIO), *Social Accounting Matrix* (SAM), serta *Choice Experiment* to simulate cross-sectoral circular impacts, income distribution, and public acceptability.	Carattini et al. (2017); Oderinwale & van der Weijde (2017); Kamil et al. (2023); Wuri et al. (2025)
	Systematic Review & Bibliometric Analysis	*Systematic Literature Review* (SLR), *Bibliometric Analysis*, dan *Social Network Analysis* (SNA) to map thematic clusters, publication trends, and synthesize global empirical evidence	Köppl & Schratzenstaller (2023); Kusumawati et al. (2025); Sing et al. (2025)
	Legal-Normative and Doctrinal Analysis of Policy	Regulatory evaluation, harmonization of national legal frameworks, revenue neutrality, and institutional governance of carbon taxes and carbon markets.	Wood (2022); Sulistiawati & Buana (2023)
Sector Focus & Analysis Units	Micro-Corporations & Specific Industrial Sectors	High-emission companies (carbon-liable firms), the energy and electricity sectors, manufacturing, transportation, and the tourism and hospitality industries.	Oderinwale & van der Weijde (2017); Rotar (2023); Wedari et al. (2024); Saramas et al. (2026)
	Macroeconomics, Multisectoral & Households	The national/regional economy, cross-border trade (trade spillovers), government tax revenue, and household purchasing power.	Carattini et al. (2017); Gurtu et al. (2022); Wood (2022); Chakraborty et al. (2023); Kamil et al. (2023); Köppl & Schratzenstaller (2023);

Mapping Dimension	Category / Cluster	Geographic Scope / Methods & Focus of Analysis	Citations of Related Articles
			Sulistiawati & Buana (2023); Kusumawati et al. (2025); Sing et al. (2025); Wuri et al. (2025); Zukauskiene & Snieska (2026)

Source: Data compiled by the author (2026)

3.1.2. Theoretical Lens Synthesis (Theoretical Lenses)

A synthesis of these 15 articles reveals five main theoretical frameworks used by researchers to explain the transmission mechanisms of carbon taxes:

a. Pigovian Tax Theory: States that carbon taxes serve to internalize the negative externalities of emissions pollution into producers' private cost structures, thereby directing resource allocation toward social efficiency [14, 2].
b. Endogenous Growth Theory: Explains that long-term carbon price signals encourage R&D investment, human capital accumulation, and clean technology innovation, which in turn generate efficiency spillovers to offset short-term cost burdens [14].
c. Double Dividend Hypothesis: Argues that recycling carbon tax revenues to reduce pre-existing distortionary taxes (such as labor or capital taxes) can provide two simultaneous benefits: improved environmental quality (the first dividend) and increased economic efficiency or employment opportunities (the second dividend) [2, 15, 16].
d. Transaction Cost Theory: Explains how organizations respond to minimize transaction and compliance costs. When the tax burden or fines are lower than the cost of investing in new technology, corporations tend to choose to pay taxes or take advantage of free incentives/credits rather than pursue radical decarbonization [17].
e. Legitimacy Theory: Explains how companies engage in green disclosure or green investment to meet stakeholder expectations, maintain their social license to operate, and avoid political costs [17].

Table 2. Systematic Mapping of 15 Selected SLR Articles

No	Author & Year	Journal	Scopus	Research Method	Main Theoretical Framework
1	Chakraborty et al. (2023)	Front. Environ. Econ.	Q2	Parametrik & Non-Parametrik Panel	Spillover Trade & Fiscal Theory
2	Kusumawati et al. (2025)	Environmental Economics	Q3	Bibliometrik & VOSviewer SNA	Thematic Cluster & Policy Network
3	Rotar (2023)	J. Risk Financial Manag.	Q2	Macroeconomic Panel Regression	Double Dividend Hypothesis
4	Saramas et al. (2026)	J. Risk Financial Manag.	Q2	Panel Data Fixed Effects Model	Pigovian & Endogenous Growth
5	Köppl & Schratzenstaller (2023)	J. Economic Surveys	Q1	Systematic Empirical Review	Double Dividend & Pigovian Tax
6	Carattini et al. (2017)	Environ. Resource Econ.	Q1	Choice Experiment & CGE Model	Public Choice & Equity Theory

7	Wedari et al. (2024)	Sustainable Futures	Q1	System GMM Panel Dynamic	Transaction Cost & Legitimacy
8	Wuri et al. (2025)	Int. J. Energy Econ. Policy	Q2	Simulasi Model GTAP-E	General Equilibrium & Trade
9	Gurtu et al. (2022)	J. Risk Financial Manag.	Q2	Granger Causality & Panel Reg	Macroeconomic Growth Theory
10	Zukauskiene & Snieska (2026)	Transform. Bus. Econ.	Q3	Stationarity & Panel Linear	Fiscal Revenue & GDP Alignment
11	Oderinwale & van der Weijde (2017)	Energy Systems	Q2	Systematic Review & Empirical Literature	Nash–Cournot Oligopoly Model
12	Sulistiawati & Buana (2023)	J. Central Banking Law	Q2	Yuridis-Normatif & Doktrinal	Legal Certainty & State Control
13	Sing et al. (2025)	Journal of Tax Reform	Q3	Systematic Review 2020-2024	SDG Alignment & Equity Theory
14	Wood J. (2022)	Canadian Tax Journal	Q1	Policy Review & Empirical Analysis	Revenue Neutrality & Tax Reform
15	Kamil et al. (2023)	Int. J. Energy Econ. Policy	Q2	Interregional Input-Output	Input-Output & Multiplier Effect

3.2. Carbon Tax Policy Architecture and Schemes

The first research question focuses on how different carbon tax implementation schemes are applied across various global jurisdictions based on rate design, sectoral coverage, revenue recycling mechanisms, and the mix of complementary policies. A synthesis of 15 articles shows that a carbon tax is not a single, uniform instrument, but rather a flexible framework that varies significantly from country to country.

3.2.1. Variations in Rate Structures and Sector Coverage

The results of the literature review indicate the existence of significant disparities in carbon tax rates and differences in sectoral coverage at the global level. In general, tariff structures and sectoral coverage across jurisdictions can be grouped into three main clusters: the high-tariff cluster, the medium-tariff cluster, and the low/initial-tariff cluster. A structured comparison of tariffs, sectoral coverage, and the proportion of national emissions covered in various countries is presented in Table 3.

Table 3. Comparison of Carbon Tax Rates, Sectoral Coverage, and Cross-Country Emissions Shares

Rate Clusters	Country	Carbon Tax Rate Range (US$/ tCO2e)	Coverage of Key Sectors & Share of National Emissions	Citations of Related Articles
1. *High-Rate Regime* >	Swedia, Swiss, Finlandia,	Swedia: US$126,2–129,89 Swiss: US$111,8–	Cross-Sectoral Coverage: Covers the industrial,	Carattini et al. (2017); Gurtu et al. (2022);

Rate Clusters	Country	Carbon Tax Rate Range (US$/ tCO2e)	Coverage of Key Sectors & Share of National Emissions	Citations of Related Articles
US$50/ tCO2e	Norwegia, and Prancis	129,86 Finlandia: US$64,5–85,10 Norwegia: US$63,7–87,61 Prancis: US$49,29–50,0	transportation, and residential/ heating sectors. Proportion of National Emissions: Accounts for 33% to 98% of total national emissions (e.g., Norway 63%–98%, Sweden 40%–86.7%, Finland 36%–76%, France 35%–38.8%, Switzerland 33%–39.3%).	Chakraborty et al. (2023); Köppl & Schratzenstaller (2023); Rotar (2023); Saramas et al. (2026); Zukauskiene & Snieska (2026)
2. *Moderate-Rate Regime* US$20–45/ tCO2e	Irlandia, Kanada, Denmark, Britania Raya, and Portugal	Irlandia: US$41,5–45,31 Kanada: US$36,2 Denmark: US$26,62–26,8 Britania Raya: US$23,65–26,7 Portugal: US$26,44–43,2	Selected Multi-Sector Coverage: Focuses on fossil fuels in the transportation, buildings, and non-ETS industrial sectors Proportion of National Emissions: Accounts for approximately 21% to 53.8% of a jurisdiction's emissions (Ireland 40%–53.8%, Portugal 29%–37.1%, Denmark 35%–48%, United Kingdom 21%–29.6%).	Gurtu et al. (2022); Wood (2022); Chakraborty et al. (2023); Köppl & Schratzenstaller (2023); Rotar (2023); Saramas et al. (2026)
3. *Low-Rate/Initial-Rate Cluster* (Low/Initial-Rate Regime ≤ US$10 /tCO2e)	Argentina, Afrika Selatan, Singapura, Chile, Jepang, Meksiko, Polandia, Vietnam, and Indonesia	Argentina: US$10,0 Afrika Selatan: US$8,5 Singapura: US$6,3 Chile: US$5,0 Jepang & Meksiko: US$2,0–3,0 Indonesia: Rp30.000 (~US$1,91–2,1) Polandia: US$0,08	Specific/Phased Coverage (Sector-Specific): In developing countries (such as Indonesia and Vietnam), initial implementation is specifically focused on the sectors that generate the most emissions namely, coal-fired power plants (PLTU) and emission-intensive	Gurtu et al. (2022); Kamil et al. (2023); Köppl & Schratzenstaller (2023); Rotar (2023); Sulistiawati & Buana (2023); Wuri et al. (2025); Saramas et al. (2026)

Rate Clusters	Country	Carbon Tax Rate Range (US$/ tCO2e)	Coverage of Key Sectors & Share of National Emissions	Citations of Related Articles
			energy sectors before being expanded to other sectors.	

Source: Data compiled by the author (2026)

Based on the data in Table 3, it is evident that the wide disparity in carbon tax rates globally reflects differences in institutional maturity, energy dependency structures, and socioeconomic priorities among countries. Developed countries in Europe particularly the "early adopters" in Scandinavia, which have implemented carbon taxes since the early 1990s apply very aggressive rates ranging from over US$50 to nearly US$130 per metric ton of CO2e [2,15,14]. The setting of high rates in Western Europe and Scandinavia is designed to create a strong price signal that exceeds the marginal cost of transitioning to clean technologies, thereby compelling industry players and households to make a tangible shift from fossil fuels to renewable energy. Furthermore, the tariffs in the first and second clusters are applied on a cross-sectoral basis, targeting the industrial, transportation, and building heating sectors which account for 40% to 98% of total national GHG emissions and are complementarily integrated with the EU Emissions Trading System (EU ETS) to close carbon leakage gaps in non-ETS sectors [18, 2].

In contrast, developing countries and several jurisdictions in Asia, Latin America, and Eastern Europe tend to apply low-to-moderate carbon tax rates that is, below US$10/tCO2e such as Argentina (US$10.0/tCO2e), South Africa (US$8.5/tCO2e), Singapore (US$6.3/tCO2e), Chile (US$5.0/tCO2e), Japan and Mexico (US$2.0–3.0/tCO2e), Poland (US$0.08/tCO2e), and Indonesia, which has set a minimum rate of Rp30,000 or approximately US$1.91–2.1/tCO2e through the Tax Regulation Harmonization Act (Law No. 7 of 2021) [19, 20, 14]. In terms of sectoral coverage, developing countries such as Indonesia and Vietnam have not immediately implemented a comprehensive carbon tax but are instead using a phased strategy that focuses initial implementation on the coal-fired power generation sector and energy-intensive industries through a cap-and-tax mechanism [19, 8, 20]. This approach of low rates and limited coverage was chosen to mitigate energy price inflation shocks, maintain public purchasing power, and protect the competitiveness of domestic industries that remain heavily reliant on coal. However, several studies have highlighted that an initial tariff that is too low risks serving merely as a tool for generating fiscal revenue and is not yet strong enough to shift corporate behavior toward investment in low-carbon technologies without a roadmap for progressive tariff increases [19, 8, 20].

3.2.2. Variations in Carbon Tax Implementation Across Countries

Based on the results of the analysis, the implementation schemes for carbon taxes in each country vary considerably. These differences are most evident in how they set rates, the targeted sectors, policy mechanisms, and how governments manage the revenue generated from these taxes [2, 7]. This means that carbon tax instruments do not follow a single, uniform standard format but are tailored to the economic conditions, energy use, and policy priorities in each region [2, 8].

First, when viewed in terms of variations in rates and the sectors subject to the tax, the results can be starkly different. For example, in Canada—as studied by Wood (2022)—carbon taxes are implemented through regulations at both the provincial and federal levels.

In British Columbia, the rate was gradually increased from CAD 10 to CAD 30 per metric ton of CO_2e between 2008 and 2012, then jumped to CAD 50 per metric ton of CO_2e in April 2022. On the other hand, in a study by Kamil et al. (2023), a carbon price of Rp30,000 per metric ton of CO_2e was applied to assess the potential for its implementation specifically at coal-fired power plants in Indonesia. This comparison shows that the tariff level cannot be separated from the relevant industrial sector, as the impact of the tax will vary depending on the characteristics of each emissions source [19, 7].

Second, in terms of policy mechanisms, each country has a different foundation. Sulistiawati and Buana (2023) analyzed the framework for carbon pricing in Indonesia, which is based on Presidential Regulation No. 98 of 2021 as the legal framework for both carbon trading and carbon taxation. Meanwhile, Wood (2022) highlights how Canada integrates this carbon tax policy with revenue-sharing mechanisms, such as through tax credits or direct subsidies to the public. From this, it is clear that carbon tax regulations are not merely about levying emission fees, but also about how they are integrated with other legal instruments and how the funds are distributed [8, 7].

Third, regarding the use of carbon tax revenue itself, the revenue neutrality approach is one of the interesting strategies implemented in Canada, namely by returning tax revenue to the public through other tax relief measures or forms of compensation [7]. However, in Rotar's (2023) study, which examined the impact of revenue recycling schemes on employment in the tourism sector, no strong evidence was found that this mechanism automatically serves as the primary determinant of its impact on that sector. Nevertheless, both studies agree that where the tax revenue is allocated remains a crucial variable for measuring its socioeconomic impact [15, 7].

Broadly speaking, variations in the implementation of carbon taxes cannot be assessed solely based on the size of the tax rate; rather, they must be viewed holistically in conjunction with sectoral coverage, regulatory frameworks, and fund management [2, 15, 7]. In other words, it is the design of these policies that is the key factor explaining why the impacts of carbon taxes vary across countries and industrial sectors [21, 8].

3.3. The Impact of a Carbon Tax on Corporate Financial Performance

The implementation of a carbon tax has the potential to affect a company's financial performance through increased costs associated with emission-generating activities, changes in investment decisions, and adjustments to the company's operational strategies [17, 21]. From the perspective of management accounting and corporate finance, the imposition of a carbon tax internalizes the external costs of direct emissions into the cost of goods sold and operating expenses on the income statement. If a company has low price elasticity or faces market competition that prevents it from passing on the tax burden to consumers, its net profit margin, operating cash flow, and return on assets (ROA) are at risk of being eroded [21, 17]. However, these impacts are not always negative, as companies can also benefit from operational efficiencies, government policy support, and adjustments to business strategies in response to environmental demands [17].

Empirical evidence regarding the relationship between carbon taxes and firm performance is presented by Wedari et al. (2024) through a study of 346 observations of publicly listed companies in Australia during the 2012–2017 period using the Generalized Method of Moments (GMM). The results of this study indicate that companies subject to carbon taxes experienced positive impacts on financial and social performance; however, the carbon tax policy, during its brief implementation period, failed to improve the emissions performance of high-polluting companies in the study sample [17] The authors attribute these results to the provision of industry assistance and free carbon credits to companies affected

by the policy, as well as companies' efforts to maintain market legitimacy in the eyes of stakeholders [17].

These findings suggest that an increase in the carbon tax burden does not automatically reduce a company's financial performance, as the policy's consequences are also influenced by accompanying government compensation mechanisms and support [17]. Nevertheless, the results of this Australian study must be understood in light of the policy's specific characteristics and the relatively short observation period, meaning they cannot be directly generalized to all countries and industrial sectors [17].

Beyond the firm level, several studies have analyzed the economic consequences of carbon taxes through sectoral and macroeconomic indicators [19, 15, 13]. Kamil et al. (2023), for example, used an interregional input-output approach to analyze the impact of implementing a carbon tax on coal-fired power plants on interregional economic linkages in Indonesia. Rotar (2023) analyzed the relationship between carbon taxes and employment in the tourism sector, while Zukauskiene and Snieska (2026) examined the relationship between carbon tax revenue and the European Union's gross domestic product. Although these indicators provide insight into the economic consequences of carbon policies, they cannot be treated as direct measures of profitability, firm value, or return on assets [19, 15, 13].

Consequently, the evidence directly linking carbon taxes to corporate financial performance in this body of literature remains more limited compared to studies on economic impacts at the sectoral and macroeconomic levels [17, 19, 15]. This situation highlights the need for further research that examines the consequences of carbon taxes using corporate financial indicators directly, while also taking into account differences in sector, emissions intensity, and the policy support received by companies [17].

3.4. The Effectiveness of Carbon Taxes in Reducing Emissions and Achieving Decarbonization

The effectiveness of a carbon tax in promoting decarbonization is linked to its ability to send a price signal regarding emission-generating activities, thereby providing companies and economic actors with incentives to adjust their energy use and investment decisions [2, 21]. However, the existence of a carbon tax does not in itself guarantee a reduction in emissions, as policy outcomes are also influenced by market structure, sector characteristics, energy grid conditions, and available technological alternatives [21].

Oderinwale and van der Weijde (2017) analyzed the impact of carbon taxes and feed-in tariffs on power generation companies' capacity expansion decisions using a Nash–Cournot model. The study's results indicate that, within this model, the expansion of renewable energy capacity and electricity prices are more strongly influenced by technical grid conditions and the number of competitors in the market than by the mere presence of economic incentives or disincentives [21]. These findings suggest that the effectiveness of carbon taxes in the energy sector must take market and infrastructure characteristics into account; thus, policy outcomes cannot be assumed to be the same across all countries [21].

Empirical evidence regarding the implementation of carbon policies is also provided by Wedari et al. (2024) through an evaluation of Australia's carbon tax policy during the 2012–2014 period. The study found that carbon tax compliance failed to improve the emissions performance of high-polluting firms in the sample, even though total emissions decreased during the policy implementation period [17]. The discrepancy between firm-level outcomes and aggregate emissions changes suggests that policy effectiveness evaluations must account for the unit of analysis used, as an overall reduction in emissions does not necessarily mean that all taxed firms successfully reduced their emissions intensity [17].

In the Indonesian context, Kamil et al. (2023) analyzed the implementation of a carbon tax on coal-fired power plants using an interregional input-output approach. The study highlighted the importance of considering interregional economic linkages when applying carbon tax policies to the energy sector, which has production linkages with other sectors [19]. However, the results of economic impact analyses using input-output models must be distinguished from measurements of actual emission reductions following policy implementation, as this approach is primarily used to trace linkages and changes in economic activity across sectors and regions [19]. In addition to technical and economic aspects, public acceptance is also a relevant factor in the sustainability of carbon tax policies [16, 7]. Carattini et al. (2017) discuss the challenges of public acceptance of environmental tax policies in the post-Paris Agreement context, while Wood (2022) examines Canada's experience in implementing the principle of revenue neutrality through the return of carbon tax revenues. Both studies demonstrate that policy design and revenue management are crucial for building support for carbon policies, although neither can be treated as direct evidence regarding the magnitude of corporate emissions reductions [16, 7].

Based on these findings, the effectiveness of a carbon tax is determined not only by the tax rate but also by energy market conditions, the characteristics of the taxed sector, the availability of low-carbon technologies, and public acceptance of the policy [16, 7,21]. Furthermore, simulation and modeling results must be distinguished from empirical evidence gathered after the policy is implemented to ensure that conclusions regarding the effectiveness of decarbonization do not exceed what is actually observed [16, 7,21].

3.5. A Synthesis of the Relationship Between Carbon Tax Design, Financial Performance, and Decarbonization

When findings regarding variations in implementation, corporate financial performance, and the effectiveness of emissions reductions are analyzed together, it becomes apparent that the design of a carbon tax serves as a factor linking environmental objectives with the economic consequences of the policy [2, 17, 7]. The setting of tax rates and sectoral coverage determines which economic activities bear the tax burden, while firm characteristics and market structure influence the ability of economic actors to respond to the policy [21, 17].

One important relationship that emerges is the potential tension between improved environmental performance and firms' financial outcomes [17]. A carbon tax can increase the costs of emission-generating activities, but government support, compensation, and carbon credits can influence the financial consequences faced by firms [17]. Therefore, the policy's impact depends not only on the tariff rate but also on the design of accompanying policies and firms' ability to adjust to changes in operating costs [21, 17].

The next relationship concerns the use of carbon tax revenues to manage the economic and social consequences of the policy [7, 15]. Returning revenues through reductions in other taxes or the provision of compensation can be part of the policy design to alleviate the burden imposed by the carbon tax [7]. However, such mechanisms need to be evaluated based on their objectives and intended beneficiaries, as revenue rebates do not automatically guarantee improved corporate financial performance or reduced emissions [7, 15].

A cross-article synthesis also shows that policy success at the macroeconomic level does not always align with outcomes at the firm level [19, 17, 13]. Reductions in aggregate emissions, changes in gross domestic product, or changes in employment are different indicators from profitability and firm value; therefore, each must be analyzed at the appropriate level of measurement [15, 17, 13]. Thus, a comprehensive evaluation of carbon taxes must link policy design to firm responses and environmental outcomes without equating indicators that have different characteristics [19, 17].

3.6. Research Gaps and Directions for Future Research

Based on the synthesis, the first gap lies in the need for a more systematic cross-country comparison of actual rates, sectoral coverage, implementation mechanisms, and the use of carbon tax revenues [2, 7]. Although the literature has discussed various national experiences, differences in regulatory contexts and economic structures mean that research findings are not always directly comparable [2, 8]

The second gap relates to the limited evidence directly linking the implementation of carbon taxes to corporate financial performance indicators [17]. Most studies have focused on measuring impacts at the macroeconomic or sectoral levels such as gross domestic product, employment, and interregional output linkages and thus have not sufficiently explained changes in corporate profitability and firm value specifically [19, 15, 13]. Future research could expand the empirical evidence by using corporate financial indicators and taking into account differences in emission intensity, industry sectors, and policy compensation mechanisms [17].

The third gap relates to measuring the effectiveness of carbon taxes in promoting decarbonization [21, 17]. Modeling and simulation results can illustrate potential market and energy sector responses to carbon policies, but they cannot be equated with evidence of actual emission reductions following policy implementation [19, 21]. Therefore, future research needs to strengthen ex-post evaluations so that policy effectiveness can be assessed based on actual changes in emissions [17].

The fourth gap is the need for research that links corporate financial performance with the effectiveness of decarbonization within a single analytical framework [21, 17]. Studies that examine both dimensions simultaneously can provide a deeper understanding of the conditions under which companies are able to maintain their financial performance while reducing emissions following the implementation of a carbon tax [17]. Thus, future research needs to consider the interrelationships between policy design, corporate financial responses, and environmental outcomes so that evaluations of carbon taxes are not limited to a single dimension of success [2, 17].

4. Conclusion

Based on a synthesis of 15 selected articles, the implementation of carbon taxes across various countries varies in terms of tax rates, sectoral coverage, collection mechanisms, and revenue management. Developed countries in Europe tend to impose high rates with broad cross-sectoral coverage of emissions, while developing countries opt for a phased approach with low initial rates focused on high-emission sectors. These differences indicate that carbon tax design is tailored to each country's economic structure, energy dependence, institutional capacity, and competitiveness.

Revenue recycling mechanisms such as reductions in other taxes, household transfers, or green financing play a crucial role in mitigating distributional burdens and enhancing public acceptance. However, these mechanisms do not automatically guarantee improved corporate performance or reduced emissions; therefore, their evaluation must be aligned with the tariff structure, sectoral coverage, and tax exemption schemes.

The impact of carbon taxes on corporate financial performance is also not uniform. Empirical evidence at the corporate level in Australia shows that companies subject to carbon taxes can achieve positive financial and social performance thanks to industry compensation and the allocation of free carbon credits, although this has not yet been shown to reduce the emissions intensity of high-polluting companies in the short term. This indicates that financial performance and environmental performance may evolve differently depending on accompanying incentive policies.

Furthermore, the effectiveness of decarbonization depends heavily on sector characteristics, market structure, infrastructure readiness, and the availability of low-carbon technologies. Energy sector modeling demonstrates that a standalone carbon tax is insufficient to drive the expansion of renewable energy, while the impacts on macroeconomic indicators (GDP, trade, and employment) and policy simulation results cannot be equated with evidence of actual emission reductions at the firm level.

Thus, it can be concluded that carbon tax schemes are context-specific across countries, where their impact on financial performance and decarbonization is determined by the appropriateness of policy design and sectoral conditions. The success of a carbon tax as an emissions control instrument must be assessed comprehensively through effective rates, emissions coverage, corporate investment responses, revenue utilization, and actual emissions reductions. This study has limitations because it covers only 15 Scopus-indexed articles with diverse methods and country contexts, and empirical evidence at the firm level remains limited. Future research is encouraged to expand the literature sources and simultaneously examine the ex-post impact of carbon taxes on corporate financial ratios and actual emission reductions.

4.1. Research Limitations

This study has several limitations. First, the analysis covers only 15 Scopus-indexed articles and therefore does not fully represent all research on carbon taxes. Second, the methods and country contexts in the analyzed articles vary considerably, so the results cannot always be directly compared. Third, empirical evidence specifically linking carbon taxes to corporate financial performance and actual emissions reductions remains limited.

4.2. Recommendations

Future research is recommended to expand the literature sources and the scope of countries covered in order to obtain a more comprehensive picture of carbon tax implementation. In addition, more empirical (ex-post) research is needed to measure the impact of carbon taxes on both corporate financial performance and emissions reductions. Future research should also consider differences in tax rates, sectoral coverage, and mechanisms for the use of carbon tax revenues.

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