
MAPPING GLOBAL RESEARCH TRENDS ON CARBON TAX REVENUE: A BIBLIOMETRIC ANALYSIS

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Abstract

This study aims to analyze the development, intellectual structure, and emerging trends of global research on carbon tax revenue through a bibliometric approach. The increasing urgency of climate change and the global transition toward low-carbon economies have intensified academic attention toward carbon taxation as both an environmental and fiscal policy instrument. This study employs a quantitative bibliometric analysis using 496 journal articles indexed in the Scopus database from 1990 to 2026. The data were analyzed using Bibliometrix and Biblioshiny in R Studio through performance analysis, citation analysis, keyword co-occurrence analysis, network visualization, and thematic evolution analysis. The findings indicate that research on carbon tax revenue has experienced significant growth, particularly after 2018, reflecting increasing global attention toward climate governance and sustainability policies. The literature is primarily structured around two dominant dimensions, namely carbon emissions and environmental policy. Furthermore, thematic evolution analysis reveals a transition from traditional environmental taxation topics toward broader themes such as sustainability, carbon footprint, climate governance, and integrated policy mechanisms. This study contributes to the environmental taxation literature by providing a comprehensive mapping of research trends and intellectual structures related to carbon tax revenue. The findings also provide policy insights regarding the growing role of carbon taxation within sustainable fiscal reform and global climate transition strategies.

Keywords: Carbon Emissions, Carbon Tax Revenue, Climate Policy, Environmental Taxation, Sustainability Governance

INTRODUCTION

Climate change has become one of the most pressing global challenges, driven by the continuous increase in greenhouse gas emissions, particularly carbon dioxide (CO₂), which contributes significantly to global warming and environmental degradation (Metcalf & Stock, 2023). The rapid growth of industrialization, fossil fuel consumption, and unsustainable economic activities has intensified global concern regarding environmental sustainability and climate governance. In response, governments and international institutions have implemented various policy instruments to reduce carbon emissions and accelerate the transition toward low-carbon economies. Among these instruments, carbon taxation has emerged as one of the most prominent market-based mechanisms for addressing environmental externalities (Stiglitz et al., 2017).

Carbon taxes are designed to internalize the social costs of carbon emissions by assigning a monetary value to environmental damage caused by economic activities (Pigou, 1920). Through this mechanism, firms and households are encouraged to reduce emission-intensive activities, improve energy efficiency, and adopt cleaner technologies. Beyond its environmental objective, carbon taxation also performs an important fiscal role by generating government revenue that can be allocated to support climate mitigation programs, renewable energy development, green infrastructure, and social compensation policies (Metcalf, 2019). This dual role positions carbon tax revenue as a strategic issue at the intersection of environmental economics, public finance, and sustainable development.

The increasing global commitment toward the Paris Agreement, net-zero emission targets, and sustainable development agendas has accelerated scholarly attention toward carbon pricing mechanisms and carbon tax revenue policies. Previous studies indicate that carbon taxation can influence energy consumption patterns, stimulate green technological innovation, and support long-term environmental sustainability (Andersson, 2019). Furthermore, Yamazaki (2017) argues that well-designed carbon tax systems are capable of reducing emissions while maintaining economic efficiency and fiscal stability. Recent discussions also emphasize the importance of revenue recycling mechanisms, where carbon tax revenue is redistributed to support green investment, reduce distortionary taxes, and protect vulnerable households from rising energy costs (Metcalf & Stock, 2023). These developments demonstrate that carbon tax revenue is increasingly viewed not merely as an environmental instrument, but also as a key component of sustainable fiscal reform and climate governance.

Despite the growing volume of literature, research on carbon tax revenue remains fragmented across multiple disciplines, including environmental economics, public finance, energy policy, and sustainability studies (Donthu et al., 2021). Most prior studies focus primarily on country-specific analyses, economic modeling, or policy evaluation, with limited attention devoted to systematically mapping the intellectual structure and thematic evolution of global research on carbon tax revenue (Zupic & Čater, 2015). Existing bibliometric studies also tend to focus broadly on carbon pricing, environmental taxation, or climate policy, rather than specifically examining the revenue dimension of carbon taxation. Consequently, the interrelationships among dominant themes such as carbon emissions, environmental policy, sustainability governance, and fiscal transition mechanisms remain insufficiently explored (Aria & Cuccurullo, 2017).

Based on these limitations, this study offers a novelty by providing a comprehensive bibliometric mapping of global research on carbon tax revenue through a quantitative science

mapping approach. Unlike previous studies that mainly emphasize empirical or country-based analyses, this study systematically identifies publication trends, intellectual structures, thematic clusters, and emerging research directions within the literature. Furthermore, this study explicitly integrates carbon emissions and environmental policy as the core dimensions shaping the development of carbon tax revenue research. By examining the interrelationships among keywords, thematic evolution, and citation structures, this study provides a more comprehensive understanding of how the literature has evolved in response to global climate challenges and sustainability agendas.

Therefore, this study aims to analyze the development, thematic structure, and emerging trends of global research on carbon tax revenue. Specifically, this study seeks to: (1) examine the evolution of scientific publications over time, (2) identify dominant research themes related to carbon emissions and environmental policy, and (3) explore emerging research trends within the literature. Through these objectives, this study is expected to contribute theoretically to the development of environmental taxation literature and practically to the formulation of more integrated and sustainable climate policy frameworks.

REVIEW OF LITERATURE

Carbon Tax and Environmental Economics

Carbon taxation originates from the concept of Pigouvian taxation, which proposes that governments should impose taxes on activities generating negative externalities in order to internalize social and environmental costs (Pigou, 1920). Within environmental economics, carbon taxes are designed to reduce greenhouse gas emissions by assigning a monetary cost to carbon-intensive activities. This mechanism encourages producers and consumers to adopt cleaner technologies and more environmentally sustainable behavior.

Carbon taxation has increasingly become one of the most widely discussed market-based instruments for mitigating climate change. According to Stiglitz et al. (2017), carbon pricing mechanisms are considered more economically efficient than conventional regulatory approaches because they provide flexibility for market participants while promoting emission reduction incentives. In addition, carbon taxation contributes to improving resource allocation efficiency and accelerating the transition toward low-carbon economies.

Carbon Tax Revenue and Fiscal Policy

Beyond its environmental objective, carbon taxation also serves an important fiscal function through the generation of government revenue. The concept of revenue recycling suggests that carbon tax revenue can be redistributed to support renewable energy investment, reduce other distortionary taxes, or provide compensation to vulnerable groups affected by rising energy prices (Metcalf, 2019). This perspective aligns with the double dividend hypothesis, which argues that environmental taxes can simultaneously improve environmental quality and economic efficiency.

Recent studies increasingly emphasize the importance of integrating carbon tax revenue into sustainable fiscal reform and climate transition strategies. Carbon tax revenue is no longer viewed solely as a byproduct of environmental taxation, but also as a strategic instrument for financing sustainable development, green infrastructure, and climate resilience programs. Consequently, the discussion surrounding carbon tax revenue has expanded beyond environmental economics toward broader issues related to sustainability governance and public finance.

RESEARCH METHOD

This study employs a quantitative bibliometric approach to systematically analyze the development of global research on carbon tax revenue. Bibliometric analysis is a statistical and science mapping method used to evaluate scientific publications and examine the intellectual structure of a research field through publication patterns, citation relationships, and conceptual networks (Zupic & Čater, 2015). This approach enables researchers to identify influential studies, dominant themes, collaboration patterns, and emerging research trends within a specific area of knowledge (Donthu et al., 2021).

The bibliographic data used in this study were obtained from the Scopus database, which is recognized as one of the most comprehensive and reliable databases for peer-reviewed academic publications across multidisciplinary fields. Scopus was selected due to its extensive journal coverage, high-quality indexing standards, and widespread use in bibliometric studies. The data collection process was conducted using the search query 'TITLE-ABS-KEY ("carbon tax revenue")' in the Scopus search engine. The initial search identified 1,540 documents. To ensure the relevance and consistency of the dataset, several inclusion criteria were applied, namely: (1) document type limited to journal articles, (2) publication language restricted to English, (3) source type limited to journals, and (4) open access availability. After applying these criteria, the final dataset consisted of 496 documents, which were considered suitable for bibliometric analysis.

The bibliographic data were exported in BibTeX format and subsequently processed using R Studio with the Bibliometrix package and Biblioshiny interface (Aria & Cuccurullo, 2017). Bibliometrix is an R-based tool specifically developed for science mapping and bibliometric analysis, while Biblioshiny provides an interactive web-based interface for statistical analysis and visualization. The use of these tools enhances transparency, reproducibility, and reliability in bibliometric data processing.

This study applies several bibliometric techniques to analyze the dataset comprehensively. First, performance analysis is conducted to examine publication growth, document characteristics, and citation performance. Second, citation analysis is applied to identify influential publications based on total citations, citation impact, and normalized citation indicators. Third, keyword co-occurrence analysis is used to explore the conceptual structure of the research field by identifying relationships among frequently occurring keywords. Fourth, network visualization analysis is performed to map thematic clusters and conceptual relationships among research topics. Finally, thematic evolution analysis is conducted to investigate the transformation and development of research themes over time, thereby identifying emerging trends and future research directions in the field of carbon tax revenue.

RESULTS AND DISCUSSION

Publication Trends and Scientific Development

The bibliometric analysis provides a comprehensive overview of the development and scientific dynamics of global research on carbon tax revenue. Based on the dataset consisting of 496 journal articles indexed in the Scopus database, the findings indicate that research on carbon tax revenue has experienced substantial growth over the last three decades. This trend reflects increasing global concern regarding climate change mitigation, environmental taxation, and sustainable fiscal policy.

As presented in Table 1, the dataset demonstrates relatively high scientific productivity and moderate citation impact within the field of carbon tax revenue research. The annual growth rate of 8.82% demonstrates that scholarly interest in carbon tax revenue has expanded significantly over time. Meanwhile, the average document age of 4.95 years suggests that this field remains relatively recent and dynamic, with continuous academic discussion and emerging research directions.

Table 1.

Description of Data

Description	Result
Timespan	1990-2026
Sources (Journals)	245
Documents	496
Annual Growth Rate (%)	8.82
Document Average Age	4.95
Average Citations per Document	23.17

Source: Processed data (2026)

The large number of publication sources further demonstrates the interdisciplinary nature of carbon tax revenue research. Studies in this field are not only concentrated within environmental economics, but also extend to public finance, energy policy, sustainability studies, and climate governance. This finding reinforces the argument that carbon taxation is increasingly viewed as a multidimensional policy instrument integrating environmental objectives with economic and fiscal considerations.

Figure 1 illustrates the annual scientific production related to carbon tax revenue research from 1990 to 2026.

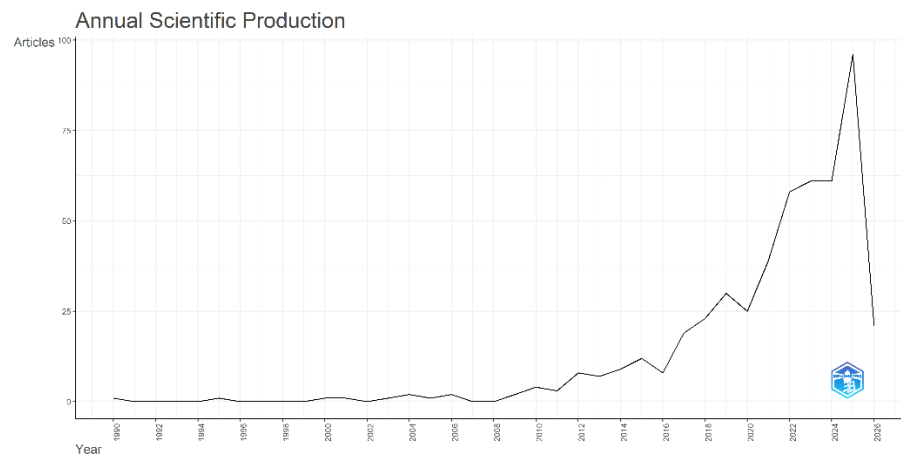


Figure 1.

Annual Scientific Production

Source: Processed data (2026)

The annual scientific production analysis reveals that publication growth remained relatively limited before 2010, followed by gradual expansion after 2015 and a substantial increase after 2018. The most significant surge occurred between 2021 and 2025, indicating rapidly growing academic attention toward carbon taxation and climate-related fiscal policies.

This sharp increase may be associated with several global developments. First, the implementation of the Paris Agreement and the strengthening of global climate commitments have intensified discussions regarding carbon pricing mechanisms and environmental taxation. Second, the increasing adoption of net-zero emission targets by various countries has accelerated interest in fiscal instruments capable of supporting decarbonization efforts. Third, the expansion of Environmental, Social, and Governance (ESG) frameworks and sustainable finance initiatives has encouraged broader academic exploration concerning the economic and policy implications of carbon taxation. Overall, the increasing trend of publications demonstrates that carbon tax revenue has evolved from a relatively niche research topic into a central issue within global environmental governance and fiscal policy discussions.

Citation Analysis and Influential Publications

The most influential publications within the field are presented in Table 2.

Table 2.

Most Cited Documents			
Paper	Total Citations	TC per Year	Normalized TC
Davis SJ (2011)	445	27.81	2.71
Maestre-Andrés S (2019)	323	40.38	8.42
Goulder LH (1995)	245	7.66	1.00
Martin R (2014)	239	18.38	3.19
Carl J (2016)	221	20.09	2.57

Source: Processed data (2026)

Citation analysis provides insights into the intellectual foundation and influential studies shaping the development of carbon tax revenue research. The findings indicate that several highly cited publications have contributed significantly to the theoretical and empirical advancement of the field.

Goulder (1995), for example, is recognized as one of the foundational studies in environmental taxation theory, particularly regarding the double dividend hypothesis, which argues that carbon taxes can simultaneously reduce environmental damage and improve economic efficiency when revenues are properly recycled. This study continues to influence contemporary discussions concerning revenue redistribution and green fiscal reform.

Meanwhile, Davis et al. (2011) contributed significantly to the understanding of carbon emissions accounting and global emission flows associated with international trade and industrial activities. The prominence of this study indicates that carbon emissions remain the primary analytical foundation underlying carbon tax policy discussions.

Furthermore, Maestre-Andrés et al. (2019) emphasized the importance of social acceptance and political legitimacy in implementing carbon taxation policies. The high citation impact of this study suggests that recent research increasingly acknowledges that the effectiveness of carbon taxes depends not only on economic efficiency, but also on public trust, policy transparency, and governance quality.

The dominance of highly cited studies focusing on environmental policy and economic impacts demonstrates that the literature on carbon tax revenue is strongly oriented toward balancing environmental effectiveness with fiscal sustainability. This finding also reflects the transition of carbon taxation research from purely theoretical discussions toward more practical and policy-

oriented approaches.

Keyword Analysis and Conceptual Structure

Figure 2 presents the most relevant keywords frequently appearing in global carbon tax revenue research.

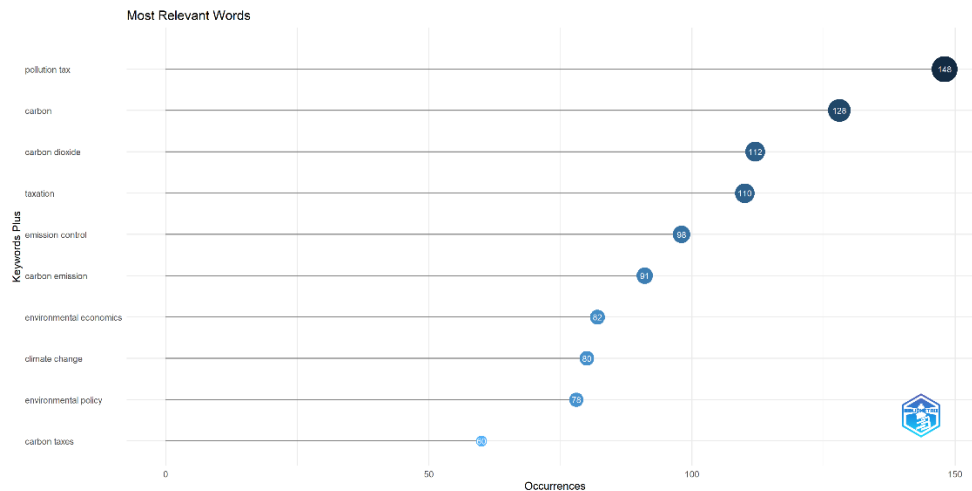


Figure 2.

Most Relevant Keywords

Source: Processed data (2026)

The keyword analysis reveals the dominant concepts shaping global research on carbon tax revenue. The most frequently occurring keywords include “pollution tax,” “carbon,” “carbon dioxide,” “taxation,” and “emission control.” These findings indicate that the literature is primarily centered on environmental taxation mechanisms and carbon emission reduction strategies.

The dominance of the keyword “pollution tax” suggests that research on carbon tax revenue remains strongly rooted in classical environmental economics theory, particularly Pigouvian taxation concepts that aim to internalize environmental externalities. This indicates that many studies continue to conceptualize carbon taxes as corrective fiscal instruments designed to address market failures caused by carbon emissions.

In addition, the strong presence of keywords such as “carbon dioxide” and “emission control” demonstrates that emission reduction remains the central objective of carbon taxation research. This finding suggests that the literature primarily focuses on environmental effectiveness and climate mitigation outcomes, rather than solely examining revenue generation aspects.

At the same time, the emergence of keywords such as “environmental policy” and “environmental economics” indicates the increasing integration of institutional and governance dimensions within carbon tax research. This development reflects the growing recognition that the success of carbon taxation policies depends heavily on regulatory quality, political commitment, and policy design mechanisms.

Co-occurrence Network Analysis

The co-occurrence network analysis provides deeper insights into the conceptual relationships among research themes within the literature. The visualization identifies two major thematic clusters characterizing the intellectual structure of carbon tax revenue research.

[illegible]

Source: Processed data (2026)

The second cluster is more closely associated with economic and fiscal dimensions. Keywords such as “taxation,” “carbon dioxide,” “emission control,” and “cost-benefit analysis” dominate this cluster, suggesting that many studies examine the economic efficiency and fiscal implications of carbon taxation policies. The interaction between these two clusters demonstrates that research on carbon tax revenue is increasingly interdisciplinary, combining environmental governance perspectives with fiscal and economic analysis. This finding indicates that the effectiveness of carbon taxation cannot be evaluated solely from emission reduction outcomes, but must also consider broader economic and policy implications.

The thematic evolution analysis illustrates the transformation of research themes over time. The findings demonstrate that the literature on carbon tax revenue has undergone substantial thematic shifts from foundational environmental taxation topics toward broader sustainability and climate governance issues.

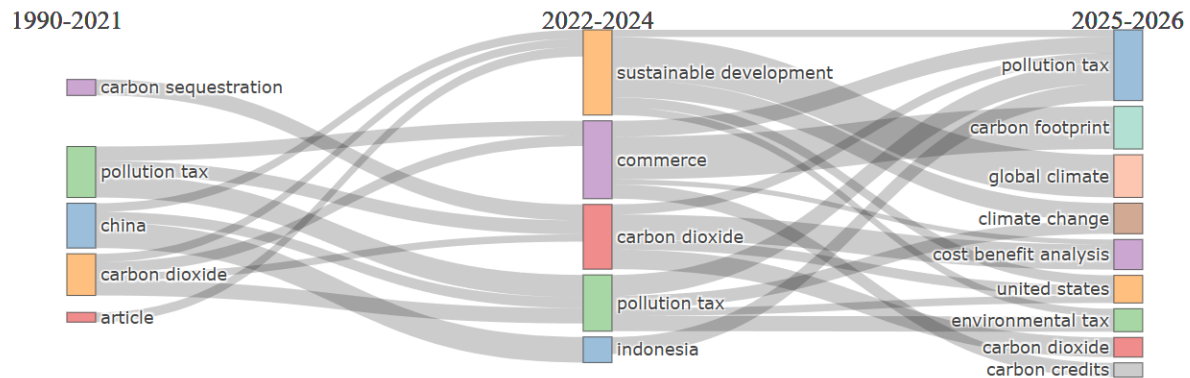


Figure 4.
Thematic Evolution

Source: Processed data (2026)

During the early period, research was primarily dominated by foundational topics such as “pollution tax,” “carbon dioxide,” and “carbon sequestration.” This indicates that early studies mainly focused on theoretical discussions concerning environmental taxation, emission pricing mechanisms, and pollution control strategies.

In the intermediate period, the literature began shifting toward broader themes such as “sustainable development,” “commerce,” and “carbon dioxide.” This transition reflects increasing scholarly interest in integrating carbon taxation within sustainable economic development and market-based environmental governance frameworks.

In the most recent period, the thematic structure evolved further toward topics such as “climate change,” “carbon footprint,” “carbon credits,” “global climate,” and “environmental tax.” This shift indicates that recent research increasingly emphasizes integrated climate governance approaches, sustainability transitions, and hybrid market-based policy instruments.

The emergence of topics such as carbon credits and carbon footprint suggests that future research may focus more heavily on the interaction between carbon taxation and carbon trading systems, as well as the role of fiscal instruments in achieving net-zero emission targets. In addition, the growing prominence of global climate governance themes indicates increasing recognition that carbon tax policies must be coordinated within broader international sustainability frameworks.

Theoretical and Policy Implications

The findings contribute theoretically to the environmental taxation literature by demonstrating the evolution of carbon tax revenue research from traditional environmental economics toward integrated climate governance and sustainability frameworks. This study also highlights the increasing interconnection between carbon emissions, fiscal policy, and sustainability governance within contemporary academic discussions.

From a policy perspective, the findings suggest that policymakers should design carbon taxation systems not only to reduce emissions but also to optimize revenue allocation for sustainable development, renewable energy investment, climate adaptation, and social protection programs. In addition, the growing emphasis on climate governance indicates the need for integrated policy

frameworks that combine carbon taxation with broader sustainability and decarbonization strategies.

CONCLUSION

This study aims to analyze the development, thematic structure, and emerging trends of global research on carbon tax revenue through a bibliometric approach. The findings indicate that research on carbon tax revenue has experienced significant growth, particularly after 2018, reflecting increasing global attention toward climate governance, sustainability transition, and environmental fiscal reform. The analysis reveals that the literature is primarily structured around two dominant dimensions, namely carbon emissions and environmental policy, which collectively shape the intellectual development of the research field. Furthermore, thematic evolution analysis demonstrates a transition from traditional environmental taxation topics toward broader issues such as sustainability governance, climate change, carbon footprint, and integrated policy mechanisms.

This study contributes theoretically by providing a comprehensive bibliometric mapping of research trends, thematic structures, and conceptual evolution related to carbon tax revenue. Practically, the findings offer insights for policymakers regarding the growing importance of carbon taxation as both an environmental and fiscal instrument capable of supporting sustainable development and climate transition strategies.

However, this study is limited to publications indexed in the Scopus database and may not fully capture all relevant literature from other academic databases. Future research is recommended to incorporate multiple databases and explore more specific issues, such as carbon tax revenue allocation, green technological innovation, carbon market integration, and the socio-economic impacts of environmental taxation, in order to enrich the literature on sustainable fiscal policy and climate governance.

REFERENCES

- Andersson, J. J. (2019). Carbon Taxes and CO₂ Emissions: Sweden as a Case Study. *American Economic Journal: Economic Policy*, 11(4), 1–30. <https://doi.org/10.1257/pol.20170144>
- Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959–975. <https://doi.org/10.1016/j.joi.2017.08.007>
- Davis, S. J., Peters, G. P., & Caldeira, K. (2011). The supply chain of CO₂ emissions. *Proceedings of the National Academy of Sciences of the United States of America*, 108(45), 18554–18559. <https://doi.org/10.1073/pnas.1107409108>
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, 285–296. <https://doi.org/10.1016/j.jbusres.2021.04.070>
- Goulder, L. H. (1995). Effects of Carbon Taxes in an Economy with Prior Tax Distortions: An Intertemporal General Equilibrium Analysis. *Journal of Environmental Economics and Management*, 29(3), 271–297. <https://doi.org/10.1006/jeem.1995.1047>
- Isbahi, M. B., Zuana, M. M. M. ., & Mariana, E. R. . (2022). The Technology Strategy in Website Communication Media in Improving Business Activities. *Majapahit Journal of Islamic Finance and Management*, 1(2), 126–138. <https://doi.org/10.31538/mjifm.v1i2.17>

- Maestre-Andrés, S., Drews, S., & van den Bergh, J. (2019). Perceived fairness and public acceptability of carbon pricing: a review of the literature. *Climate Policy*, 19(9), 1186–1204. <https://doi.org/10.1080/14693062.2019.1639490>
- Metcalf, G. E. (2019). On the Economics of a Carbon Tax for the United States. *Brookings Papers on Economic Activity*, 1 (Spring), 405–484. <https://ideas.repec.org/a/bin/bpeajo/v50y2019i2019-01p405-484.html>
- Metcalf, G. E., & Stock, J. H. (2023). The Macroeconomic Impact of Europe's Carbon Taxes. *American Economic Journal: Macroeconomics*, 15(3), 265–286. <https://doi.org/10.1257/mac.20210052>
- Pigou, A. C. (1920). *The Economics of Welfare*. <https://oll.libertyfund.org/titles/pigou-the-economics-of-welfare>
- Stiglitz, J. E., Stern, N., Duan, M., Edenhofer, O., Giraud, G., Heal, G. M., la Rovere, E. L., Morris, A., Moyer, E., Pangestu, M., Shukla, P. R., Sokona, Y., & Winkler, H. (2017). *Report of the High-Level Commission on Carbon Prices*. Columbia University Libraries. <https://doi.org/10.7916/D8-W2NC-4103>
- Yamazaki, A. (2017). Jobs and climate policy: Evidence from British Columbia's revenue-neutral carbon tax. *Journal of Environmental Economics and Management*, 83, 197–216. <https://doi.org/10.1016/j.jeem.2017.03.003>
- Zupic, I., & Čater, T. (2015). Bibliometric Methods in Management and Organization. *Organizational Research Methods*, 18(3), 429–472. <https://doi.org/10.1177/1094428114562629>