



## Carbon Tax Research Trend

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**ABSTRACT:** This research focuses on mapping articles that discuss carbon tax published through sinta 1 and 2 accredited journals and scopus quartile 1 and 2. The purpose of this research is to explore more deeply about carbon tax research with a focus on business management and accounting in the 2015-2023 period. The method used in this research is a quantitative method with a bibliometric approach. This bibliometric approach is used to determine the development of research topics related to carbon tax research trends. Research samples, journal names, publication years, research methods, types of research variables and research data sources are the basis for mapping in this study. This research also visualizes carbon tax keywords using VOSviewer software. The results found that the search for articles that discuss carbon tax research found 8 articles published from accredited journals Sinta 1 and Sinta 2 and 50 articles from journals indexed by Scopus quartile 1 (Q1) and quartile (Q2). This study contributes to knowing the trend of scientific publications on carbon tax, and provides an opening for researchers in conducting future research by conducting deeper calculations related to the amount of carbon emissions and carbon tax involving subjectivity in disclosure assessment.

**Keywords:** Carbon Emissions, Carbon Tax, Taxation



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## INTRODUCTION

Global problems can threaten various things both in terms of the environment and human life ([Lindenmayer et al., 2023](#)). This threat is the impact of climate change arising from global problems. One of the triggers of climate change is the increase in exposure to greenhouse gases (GHG) (Mar et al., 2022). The United Nations (UN) suggests that the increase in GHG exposure will occur in line with economic growth, population and the increase in the level of human life ([Belmonte-Ureña et al., 2021](#)). The solution to reducing greenhouse gas (GHG) emissions can be done if a carbon tax is implemented ([Brand et al., 2013](#); [Ihsan & Hutama, 2023](#); [Qiu et al., 2020](#)). Several countries in the world have implemented carbon taxes such as Finland ([Roh et al., 2020](#); [Zhou et al., 2021](#)). Apart from Finland, carbon tax has also been implemented for a long time in Africa ([Alton et al., 2014](#); [Choi, 2013](#); [Shu et al., 2017](#)). Carbon tax is an excise tax levied based on the amount of energy including coal, coke, gas, and crude oil ([Dong et al., 2023](#); [Dwyer et al., 2013](#);

[J. Zhang et al., 2024](#)). The existence of a carbon tax policy makes it possible for entities to do business with the minimum possible (spending the smallest possible cost) but as much as possible to increase finances that can increase entity profits. This strategy has the potential to increase state revenue. The revenue can be allocated to sustain economic growth and improve national development for a country ([Zhao et al., 2022](#)).

Carbon tax is one of the most interesting topics to be researched further. A lot of research has been done by previous researchers who focus on one subject area such as business, management and accounting with the keyword carbon tax. ([Chang et al., 2023](#); [Goh et al., 2023](#); [Mashhadi Rajabi, 2023](#); [O’Ryan et al., 2023](#); [Ramadhani & Koo, 2022](#); [Sun & Chen, 2022](#); [Q. Zhang et al., 2022](#); [S. Zhang et al., 2023](#)). This study was motivated by research from (Wimala & Yeremy, 2022) on bibliometric analysis of tax research. Researchers tried to re-examine in the same way related to taxation, namely carbon tax. By using 8 articles on carbon tax in 7 accredited journals Sinta 1 and Sinta 2 during 2015. In addition, researchers also used Scopus Quartile 1 and Quartile 2 indexed journals with a total of 50 articles on carbon tax found during 2015.

This research aims to explore in more depth about carbon tax research with a focus on the field of business management and accounting where gaps will be sought that can be researched by future researchers. Previous research examined the potential application of carbon tax policies in industry using the bibliometric analysis method. The difference in research conducted by previous researchers is that researchers focus more on the subject area with the keyword carbon tax and the subject area of business, management and accounting. Previous research conducted by Wimala & Yeremy (2022) looked at the effect of carbon tax implementation, especially in the construction industry in countries that have implemented carbon taxes before. In addition, Wimala & Yeremy's research (2022) looked at the potential for its application in Indonesia and also used SWOT analysis to determine internal and external factors in the implementation of carbon tax policies. Based on the above statements, researchers focused on selecting Sinta 1 and 2 indexed journals and Scopus indexed journals with quartile 1 (Q1) and quartile 2 (Q2). Thus, 8 Sinta 1 and 2 articles and 50 quartile 1 (Q1) and quartile 2 (Q2) articles were collected for the period 2015-2023. The period of 2015-2023 was chosen by researchers because in 2015 there was the Paris Agreement. This agreement controls countries to reduce carbon dioxide and greenhouse gas emissions to limit global warming below 2.0 degrees Celsius ([Delbeke et al., 2019](#); [Kuo et al., 2016](#); [Ran & Xu, 2023](#); [Stefano & Richard, 2009](#)).

The contribution of this research is to determine the trend of scientific publications on carbon tax, the core journals of scientific publications on carbon tax, journals of scientific publications based on research variables, scientific publications based on year of publication, research methods, scientific publications on carbon tax research data sources and visualization of carbon tax keywords using VOSviewer. Second, this article provides an overview of future research to conduct deeper calculations related to the amount of carbon emissions and carbon tax and involves subjectivity in assessing disclosure. In addition, the contribution of research on carbon tax with bibliometric analysis is expected to contribute to the development of science as a form of progress in human civilization.

The literature review aims to report trends, relationships, consistencies, and gaps so that work can be done in an organized manner and can be evaluated. According to Donthu et al. (2021) Bibliometric analysis is a popular method that can be used in exploring and analyzing large amounts of scientific data. This can make it possible to reveal the evolution in a particular field, as well as highlight the developing fields in the field being studied (Donthu et al., 2021). According to (Haryani & Sudin, 2020) in the implementation of bibliometric analysis, there are several steps that must be taken, including the data search process. This bibliometric data search was carried out manually by accessing Sinta and Scopus web journals with the keyword carbon tax and focusing on the business, management and accounting sub-area. In the bibliometric analysis, researchers chose journals accredited by Sinta 1 and 2 and Scopus with Quartile 1 and 2. Bibliometric analysis was carried out on two aspects; (1) development trends in journals with carbon tax keywords. For the second aspect, using visualization of the results of bibliometric analysis with the help of Vosviewer.

Bibliometrics is conducted to further explore the research on carbon tax with a focus on business management and accounting where it will look for blemishes that can be researched by future researchers. This article is presented in 5 sections. The first is the introduction, the second is the literature review, the third is the research method, the fourth is the results and discussion, which presents information related to mapping based on mapping the name of the scientific journal and the year of publication of the research, mapping the year of publication of carbon tax articles, mapping the carbon tax method, and mapping the source of research data and finally the fifth is the closing (conclusion).

## METHODS

The research conducted by the researcher used descriptive quantitative with bibliometric approach. The unit of analysis used in this research is scientific articles on carbon tax. The research data source is scientific publications on carbon tax with accredited scientific journals Sinta 1 and 2 and Scopus quartile 1 and 2. The reason for choosing these accredited scientific journals is because Sinta 1 and 2 are national journals that have been verified or have been recognized as true and have been reviewed by several reliable reviewers to be published. Researchers use the Scopus data base because they consider the quality of reputation that has been recognized internationally. In addition, Scopus also has a big impact on a journal or institution in the world of scientific publications. The population used is scientific publications on carbon tax that have been scientifically published and indexed by Sinta 1 and 2 and Scopus quartile 1 and quartile 2. The samples used in this study are scientific publications on carbon tax indexed by Sinta 1 and 2 and Scopus quartile 1 and quartile 2 for the last 8 years from 2015-2023, found 8 Sinta 1 and 2 articles and 50 Scopus quartile 1 and 2 articles.

The data collection technique used by researchers is secondary data. Researchers conduct searches by opening the Scopus database at [www.scopus.com](http://www.scopus.com) with a subscription account (paid) so that researchers can access all its features. Then the researcher uses the term or keyword carbon tax (carbon tax) with the search results taken in the article title. The data obtained by researchers is publication data in the field of taxation with the scope of carbon tax for the last 8 years, namely 2015-2023. After obtaining the search results, researchers began to explore the Sinta and Scopus

databases to see the core journals of scientific publications on carbon tax, journals of scientific publications based on research variables, scientific publications based on the year of publication and research methods and scientific publications on carbon tax research data sources. Furthermore, the researcher made an effort to visualize the development of research on carbon tax using VOSviewer software and presented the result items for the top 4 clusters.

## RESULT AND DISCUSSION

### Research sample selection result

A total of 8 carbon tax articles were collected from national scientific journal sites indexed by Sinta 1 and 2. Can be seen from table 1. In addition, there are also 50 articles on carbon tax from international scientific journal sites indexed by Scopus quartile 1 (Q1) and quartile 2 (Q2). Both types of journals have a submission deadline of December 31, 2023. Some articles that do not fit the sample criteria will be excluded and here there are 58 eligible articles, of which there are 50 scopus Q1 and Q2 articles and 8 sinta 1 and 2 articles. The selection of the article sample is presented in table 1. For articles that do not meet the requirements such as not including sinta 1 and 2 journals and Q1 and Q2 scopus journals will be excluded from the sample selection results. The samples that have been selected based on the filters that have been selected by researchers will then be discussed in more detail in the next discussion.

For Figure 1, the researcher focuses on explaining the development of articles published from accredited journals Sinta 1 and 2. It can be observed that the distribution of publications in 8 articles from 2015 to 2023. In 2016 there was only 1 article from Sinta that explained about carbon tax. As for 2016 and 2017, there were no articles published in Sinta 1 and 2 that discussed carbon tax. In 2019 there was 1 article published from a sinta accredited journal. However, in 2020 and 2021 there were no articles published from sinta 1 and 2 journals. 2022 is the year when sinta 1 and 2 accredited articles can increase to 4 articles that discuss carbon tax. In 2023 there were publications from sinta 1 and 2 journals but only 2 articles were published. Thus, it can be said that 2022 is the year with the highest number of published articles, namely 4 articles since the last 8 years 2015 to 2023. In 2023 is the year that has the second most publications with a total of 2 articles published in Sinta 1 and 2, the rest in 2016 and 2021 only 1 article can be published. Apart from these years there were no articles published in national accredited journals Sinta 1 and 2. Thus, research on carbon tax is still minimal because only 8 studies with 7 journals as a place of publication.

Figure 2 is the distribution of Q1 and Q2 scopus journals in 2015-2023. Researchers added Q1 and Q2 scopus journal mapping sources because according to researchers if the coverage of sinta 1 and 2 journals is only a few and still minimal. Researchers mapped from 2015 to 2023, which is the same as the coverage of sinta 1 and sinta 2 mapping. From Figure 2, it can be observed that in 2015 and 2016 there were only 2 studies that discussed carbon tax. 2015 and 2016 were the years with the least number of carbon tax studies. From Figure 2, it can be observed that 2019 and 2023 are the years with the highest number of studies on carbon tax, each of which has 11 articles or 11 studies. From 2017 to 2019, there was an increase in research on carbon tax. 2020 experienced a decrease in the number of studies where there were only 4 articles. After 2020 until 2023 there was

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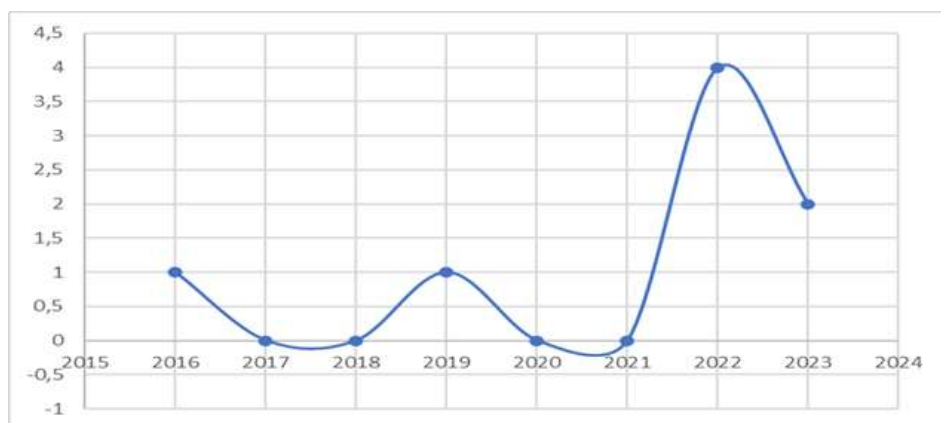
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an increase in the number of studies on carbon tax. Thus, it can be concluded that the amount of carbon tax research conducted from 2015 to 2023 is quite a lot, namely 50 articles. The 50 scientific articles on carbon tax research are accredited by Scopus Q1 and Q2.

**Table 1.** Carbon tax research sample selection

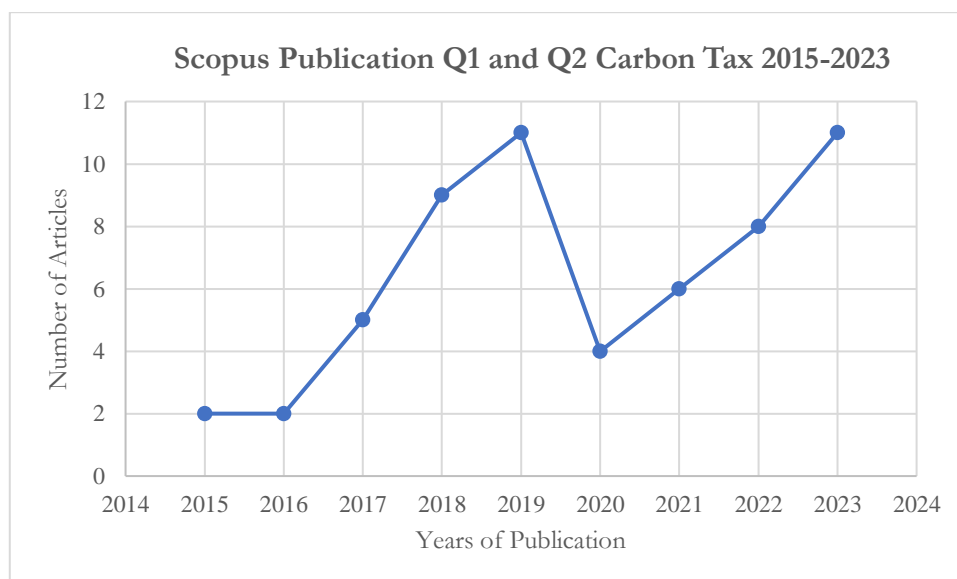
No.	Research Sample Selection Criteria	N
1	Articles on sinta 1 and sinta 2 websites	8
2	Articles on Scopus Q1 and Q2 accredited international journal Websites	50
3	Incomplete article	0
4	Articles that do not match the research topic	0

**Publication of Sinta 1 and 2 Carbon tax 2015-2023**



**Figure 1.** Distribution of Sinta 1 and 2 Journals 2015-2023

Source: Sinta.kemendikbud.go.id (2023)



**Figure 2.** Scopus Journal Distribution Q1 and Q2 2015-2023

Source: Scopus.com (2023)

### Mapping by scientific journal name and publication year

Table 2 shows a description of the mapping of Sinta 1 and 2 carbon tax publications based on journal names. The mapping of scientific journal names and years of publication refers to and is the same as research conducted by Sari et al. (2023). Sari et al. (2023) describes the classification of articles based on the name of the scientific journal and year of publication. This analysis can provide an overview of information related to the distribution of articles on carbon tax from year to year and what journals can dominate for the publication of scientific articles. In addition, this analysis is also used to see the consistency of journals in publishing articles on carbon tax. Table 2 shows that the journal Indonesian Treasury Review: Journal of Treasury, State Finance, and Public Policy and Journal of Accounting and Finance are the national scientific journals that publish the most articles on carbon tax, namely 2 articles (25%). The other types of journals can only publish 1 (12.5%) article on carbon tax. From table 2 observed by researchers for the last 8 years, the Journal of Treasury, State Finance, and Public Policy and the Journal of Accounting and Finance have consistently published articles on carbon tax where there are 2 articles each (25%).

Table 3 shows that the Journal of Cleaner Production is the international scientific journal that publishes the most articles on carbon tax. Journal of Cleaner Production published 27 articles (54%). The journal with the second most articles is the International Journal of Production Economics. The International Journal of Production Economics published articles on carbon tax with a total of 6 articles (12%). Apart from the journals mentioned above, there is only 1 article (2%) in each journal. Table 3 also explains that the Journal of Cleaner Production from 2015-2023 has been consistent for the last 8 years. This is because in the last 8 years the Journal of Cleaner Production is the journal with the most publications. Thus, apart from the Journal of Cleaner Production, the opportunity to publish articles on carbon tax is an opportunity for further researchers. From table 3, it can be seen that there are many only 1 journal that contains articles about carbon tax.

**Table 2.** Mapping of Sinta 1 and 2 *Carbon tax* publications by journal name

No	Journal Name	Year of Publication n 2015-2023 (Total Article)	Percentage (%)
1	Jurnal Manajemen Teknologi : Indonesian Journal for the Science of Management	1	12,5%
2	Indonesian Treasury Review: Jurnal Perbendaharaan, Keuangan Negara, dan Kebijakan Publik	2	25%
3	Jurnal Akuntansi Riset	1	12,5%
4	Jurnal Reviu Akuntansi dan Keuangan	1	12,5%
5	Internasional Jurnal of Artifical Intelligence Research	1	12,5%
6	Jurnal Akuntansi Dan Keuangan	2	25%
<b>Total</b>		<b>8</b>	<b>100%</b>

Source: Personal Data Processing Results (2023)

**Table 3.** Mapping of Q1 and Q2 Scopus *Carbon tax* publications by journal name

No.	Journal Name	Year of Publication 2015-2023 (Total Articles)	Percentage (%)
1	Journal of Cleaner Production	27	54%
2.	International Journal of Production Economics	6	12%
3	National Tax Journal	1	2%
4.	Pakistan Journal of Commerce and Social Sciences	1	2%
5.	Socio-Economic Planning Sciences	1	2%
6	Technological Forecasting & Social Change	1	2%
7	Tourism Economics	1	2%
8	Transportation Research Part E	1	2%
9	Annals of Tourism Research	1	2%
10	Current Issues in Tourism	1	2%
11	Decision Sciences	1	2%
12	The Electricity Journal	1	2%
13	Industrial Management and Data Systems	1	2%
14	Journal of Global Information Management	1	2%
15	Journal of Hospitality and Tourism Management	1	2%
16	Journal of Modeling in Management	1	2%
17	Meditari Accountancy Research	1	2%
18	Operational Research	1	2%
19	Omega (United Kingdom)	1	2%
<b>Total</b>		<b>50</b>	<b>100%</b>

Source: Personal Data Processing Results (2023)

### Mapping by Year of Publication

Table 4 shows the Mapping of the Year of Publication of Sinta 1 and 2 *carbon tax* articles. Based on the year of publication, 2022 is the number of years with the most articles published than other years, namely 4 articles (50%). The year 2022 is also the most research topics on *carbon tax* since the last 8 years. Then in 2023 is the year with the second most publications from sinta 1 and sinta 2 journals. The number of *carbon tax* research in 2023 was 2 scientific articles (25%). For 2016 and 2019 are years where there is only 1 publication of scientific articles (12.5%). Apart from the previously mentioned years, there were no studies explaining *carbon tax* indexed by Sinta 1 and Sinta 2. Thus, *carbon tax* is still very minimal to be published in nationally accredited journals such as sinta 1 and sinta 2. The year that there are no scientific publications on *carbon tax* is an

interesting finding. This is because *carbon tax* is a new thing implemented in Indonesia and is a very interesting trend topic if studied in more depth and can add to the treasure of knowledge in the field of taxation.

Table 5 describes the mapping of the year of publication of carbon tax articles from Scopus Q1 and Q2. The year 2019 is the largest year of publication of articles describing carbon tax from Scopus Q1 and Q2, namely 10 articles (20%). Furthermore, the second most research on carbon tax is shown in 2018 and 2023. These years both published scientific research articles on carbon tax (carbon tax) as many as 9 articles (18%). 2021 is the third year that describes scientific research on carbon tax, namely 6 articles (8%). 2016 was the year that published the fewest articles in Scopus Q1 and Q2, namely 1 article (2%). In 2016, research on carbon tax was still minimal. Of course, this is an opportunity for researchers to further research during the year. Fluctuations since the last 8 years from 2015 to 2023 have increased research on carbon tax. Thus, research on carbon tax can continue to be developed because considering that since the last 8 years only 50 articles indexed by Scopus Q1 and Q2.

**Table 4.** Mapping of the Year of Publication of Sinta 1 and 2 *Carbon tax* Articles

Year	Number of Articles	Percentage (%)
2023	2	25%
2022	4	50%
2021	0	0%
2020	0	0%
2019	1	12,5%
2018	0	0%
2017	0	0%
2016	1	12,5%
2015	0	0%
<b>Total</b>	<b>8</b>	<b>100</b>

Source: Personal Data Processing Results (2023)

**Table 5.** Mapping of the Year of Publication of Q1 and Q2 Scopus *Carbon tax* articles

Year	Number of Articles	Percentage (%)
2023	9	18%
2022	4	8%
2021	6	12%
2020	4	8%
2019	10	20%
2018	9	18%
2017	5	10%
2016	1	2%
2015	2	4%
<b>Total</b>	<b>50</b>	<b>100%</b>

Source: Personal Data Processing Results (2023)



### Mapping by Research Method

Table 6 presents information about the mapping based on the research method of carbon tax articles Sinta 1 and 2. In 2022 and 2023, many carbon tax studies conducted research with quantitative methods. Quantitative research in 2022 and 2023 each with the number of articles 2. Quantitative research also occurred in 2019. In 2019 there was only 1 research on carbon tax using quantitative methods. Since the last 8 years quantitative research amounted to 5 studies (62.5%). Meanwhile, qualitative research was highest in 2022. In 2022 carbon tax research using qualitative methods was only 2 articles. While other research occurred in 2016, but only consisted of 1 qualitative method research article. The number of qualitative research methods since the last 8 years is 3 articles (37.5). Interestingly enough, there are no mixed methods in carbon tax research. Thus it can be concluded that the opportunity for future researchers is to increase the number of mixed research methods. In addition, it can be developed more deeply and more research with qualitative methods. This is because qualitative research is less when compared to quantitative research.

Furthermore, Table 7 presents the mapping based on the research methods of Q1 and Q2 scopus carbon tax articles. When viewed from table 7, the number of quantitative and qualitative research methods has the same proportion, namely 24 research methods each (48%). In quantitative research methods, 2019 was the year with the most research using quantitative methods, namely 7. 2018 also dominated, namely there were 6 quantitative research methods. 2015 was the least year that used quantitative research. For qualitative research, 2023 is the year with the most research in qualitative methods, namely 7. The least research on qualitative occurred in 2015, 2016, 2022, namely only 1 each. For mixed methods only 2 (4%), occurred in 2021 and 2023. Thus the gap from further researchers can use mixed methods because in mixed methods there are still minimal researchers to research it.

**Table 6.** Mapping by Research Method of *Carbon Tax* Articles Sinta 1 and 2

Year	Research Methods (Number of Articles)			Number of Articles
	Quantitative	Qualitative	Mixed	
2023	2	0	0	2
2022	2	2	0	4
2021	0	0	0	0
2020	0	0	0	0
2019	1	0	0	1
2018	0	0	0	0
2017	0	0	0	0
2016	0	1	0	1
2015	0	0	0	0
<b>Total</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>8</b>
<b>(%)</b>	<b>(62,5%)</b>	<b>(37,5%)</b>	<b>(0%)</b>	<b>(100%)</b>

Source: Personal Data Processing Results (2023)

**Table 7.** Mapping by Research Method of Q1 and Q2 Scopus *Carbon tax* Articles

Year	Research Methods (Number of Articles)			Number of Articles
	Quantitative	Qualitative	Mixed	
2023	1	7	1	9
2022	3	1	0	4
2021	2	3	1	6
2020	1	3	0	4
2019	7	3	0	10
2018	6	3	0	9
2017	3	2	0	5
2016	0	1	0	1
2015	1	1	0	2
<b>Total</b>	<b>24</b>	<b>24</b>	<b>2</b>	<b>50</b>
<b>(%)</b>	<b>(48%)</b>	<b>(48%)</b>	<b>(4%)</b>	<b>(100%)</b>

Source: Personal Data Processing Results (2023)

### Mapping by Research Variable Type

Table 8 shows the mapping of carbon tax research variables based on journals indexed by Sinta 1 and Sinta 2. The *carbon tax* variable is the variable with the highest total of 4 (25%). Furthermore, the Constraints and Green Economics variables are the second most variables, namely 2 (12.5%). Over the past 8 years, the total variables found from 8 articles are 16 variables (100%). Thus, it can be concluded that the use of variables other than *carbon tax*, constraints and green economics can be used in research on carbon tax because it is still very minimal. In Table 9, there is also a mapping of the types of research variables on carbon tax (carbon tax). The mapping is mapped from Q1 and Q2 scopus indexed journals. During the last 8 years 2015-2023 there were 33 research variables (100%) from 50 Q1 and Q2 scopus articles. The variables of *carbon tax*, Reducing energy consumption, Economy and The tourism industry are the most variables of other variables, namely 4 (8.33%). The environment variable is the 2nd variable with the most total variables over the last 8 years, namely 3 (6.25%). *Carbon tax* research seen from table 9 which is still 1 variable (2.08%) can be used as a development in future research.

**Table 8.** Mapping by research variable type *Carbon tax* Sinta 1 and 2

No.	Research Variables	Total Articles 2015-2023	Percentage (%)
1	Carbon Emission Disclosure (CED)	1	6,25%
2	Company Value	1	6,25%
3	<i>Carbon tax</i>	4	25%
4	Carbon Emissions	1	6,25%
5	CARBON PRICING	1	6,25%
6	MONITORING SYSTEM	1	6,25%
7	Carbon Accounting	1	6,25%
8	Constraints	2	12,5%

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9	<i>Carbon tax</i> policy	1	6,25%
10	Environmental Taxation	1	6,25%
11	Green Economics	2	12,5%
<b>Total</b>		<b>16</b>	<b>100%</b>

Source: Personal Data Processing Results (2023)

**Table 9.** Mapping by type of research variable *Carbon tax* Scopus Q1 and Q2

No.	Research Variables	Total Articles 2015-2023	Percentage (%)
1	Environmental tax	1	2,08%
2	Productivity	2	4,16%
3	Energy efficiency	2	4,16%
4	The fairness of <i>carbon tax</i>	1	2,08%
5	Reduced water consumption	1	2,08%
6	Reducing energy consumption	4	8,33%
7	CCUS source-sink matching	1	2,08%
8	Economy	4	8,33%
9	Speed sensitivity	1	2,08%
10	Household demand	1	2,08%
11	Strategy and performance of low-carbon	1	2,08%
12	Management decisions	1	2,08%
13	Emission allowances	1	2,08%
14	Emission price	1	2,08%
15	Enterprise decisions	1	2,08%
16	Supply chain enterprise operations	1	2,08%
17	Government <i>carbon tax</i>	1	2,08%
18	<i>Carbon tax</i> policy	2	4,16%
19	Changes in market shares of domestic producers	1	2,08%
20	Changes in exports	1	2,08%
21	Manufacturing and remanufacturing decisions	1	2,08%
22	Social welfare	1	2,08%
23	Green subsidies	2	4,16%
24	Revenue sharing and first-mover advantage	1	2,08%
25	Consumer environmental awareness	2	4,16%
26	Environmental audits	1	2,08%
27	Renewable energy consumption	1	2,08%
28	The environment	3	6,25%
29	The tourism industry	4	8,33%
30	Carbon capture (storage)	1	2,08%
31	Network participation	1	2,08%
32	Enterprise decisions	1	2,08%
<b>Total</b>		<b>48</b>	<b>100%</b>

Source: Personal Data Processing Results (2023)

### Mapping by research data source

The mapping of research data sources is done by classifying articles on *carbon tax* based on data sources, namely primary data, secondary data, and mixed data (primary and secondary). Tables 11 and 12 show the mapping based on the research data sources. Table 11 maps *carbon tax* research data sources from Sinta 1 and 2 indexed journals while Table 12 maps *carbon tax* research from Scopus Q1 and Q2 journals. Table 11 shows that secondary data is the most widely used research data in *carbon tax* research during 2015-2023. Secondary data sources in research on this topic are obtained from entity report data and for primary data sources in this study are obtained from questionnaire surveys, observations, interviews, documentation, and experiments. For table 12 for the last 8 years, the most secondary data is also 26 (52%). No different from table 11 for this secondary data is also obtained from entity report data while for secondary data, namely from questionnaire surveys and others. For mixed data, both tables 11 and 12 are data that is minimally used, of course this is interesting for future research if you use mixed data.

**Table 10 :** Mapping by data source of *Carbon tax* research Sinta 1 and 2

Year	Research Data Source (Number of Articles)			Number of Articles
	Primary Data	Secondary Data	Mixed	
	2023	1	1	
2022	2	2	0	4
2021	0	0	0	0
2020	0	0	0	0
2019	0	1	0	1
2018	0	0	0	0
2017	0	0	0	0
2016	0	0	1	1
2015	0	0	0	0
<b>Total</b>	<b>3</b>	<b>4</b>	<b>1</b>	<b>8</b>
(%)	(37,5%)	(50%)	(12,5%)	(100%)

Source: Personal Data Processing Results (2023)

**Table 11 :** Mapping by data source of Q1 and Q2 Scopus *Carbon tax studies*

Year	Research Data Source (Number of Articles)			Number of Articles
	Primary Data	Secondary Data	Mixed	
2023	4	4	1	9
2022	3	1	0	4
2021	2	4	0	6
2020	1	3	0	4
2019	4	5	1	10

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2018	4	5	0	9
2017	3	1	1	5
2016	0	1	0	1
2015	0	2	0	2
<b>Total</b>	<b>21</b>	<b>26</b>	<b>3</b>	<b>50</b>
<b>(%)</b>	<b>(42%)</b>	<b>(52%)</b>	<b>(6%)</b>	<b>(100%)</b>

Source: Personal Data Processing Results (2023)

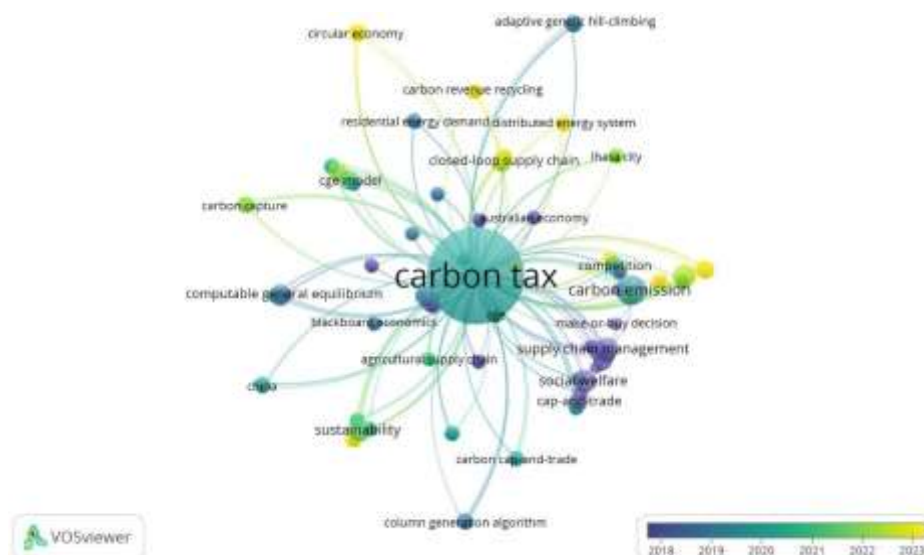


Figure 3 Visualization of *Carbon tax* Keywords from Scopus Journals Q1 and Q2

Source: Personal Data Processing Results (2023)

From the results of data processing in Figure 3 using keywords, the *carbon tax* research development map indexed by Scopus from 2015-2023 formed 32 clusters with a total of (162 items). Researchers will display the top 4 clusters with a total of (41 items). The presentation of the 4 clusters will be displayed in table 13 below.

Table 12 : Exposure of items from each cluster in Q1 and Q2 scopus journals on *Carbon tax*.

No	Cluster	Item of Each Cluster
1	Cluster 1 (11 item)	<ol style="list-style-type: none"> <li>1. aviation Sector</li> <li>2. climate Change</li> <li>3. dynamic recursive cge</li> <li>4. environmental policy</li> <li>5. inservice optimization</li> <li>6. location</li> <li>7. mechanism design</li> <li>8. production technology</li> <li>9. revenue recycling</li> <li>10. sustainability</li> </ol>

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		11. transport-related carbon-emissions
2	Cluster 2 (11 item)	1. carbon emission abatement 2. consumer environmental awareness 3. cost-sharing 4. environmental awareness 5. first-mover advantage 6. make-or-buy decision 7. pricing decision 8. retailer-driven 9. revenue sharing 10. revenue-sharing 11. supply chain management
3	Cluster 3 (10 item)	1. carbon capture and storage 2. dispatch optimization 3. emission reduction potential 4. environmental audits 5. environmental management systems 6. low carbon dispatch 7. mixed-integer linear programming 8. operating expenses 9. renewable energy 10. tokyo stock exchange
4	Cluster 3 (10 item)	1. carbon emissions reduction 2. cge model 3. chile 4. co2 emissions 5. construction sector 6. dynamic stochastic general equilibrium model 7. economy-wide effects 8. environmental quality 9. output 10. tourism

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Source: Personalized Result (2023)

## CONCLUSIONS

This study aims to explore *carbon* tax research with a focus on business management and accounting in scientific journals indexed by Sinta 1 and 2 and Scopus Q1 and Q2 during the period 2015-2023. The number of studies used in this study is 58 articles consisting of 8 Sinta articles and 50 Scopus articles selected according to predetermined procedures. This study dominates that the dominating publication year in Sinta 1 and 2 journals is 2022. As for Q1 and Q2 Scopus journals, namely 2019 and 2023. Indonesian Treasury Review: Journal of Treasury, State Finance, and Public Policy and Journal of Accounting and Finance are journals that publish

the most articles from Sinta 1 and 2 journals, namely 2 articles (25%). For Q1 and Q2 Scopus journals, Journal of Cleaner Production is the journal that published the most articles from 2015-2023, namely 27 articles (54%). Quantitative method is the most used research method in carbon tax research in Sinta 1 and Sinta 2 as well as Scopus Q1 and Q2. For data sources, most researchers use secondary data sources. Visualization of *carbon tax* keywords found 32 clusters with a total of 162 word items. Researchers only present the top 4 clusters with a total number of items 41. In this study, only the keyword *carbon tax* was used to search for journals. Thus, further research can add several keywords related to the topic of *carbon tax* so that more research articles on *carbon tax* will be collected. Limitations of this research also exist from the search process where some journal sites when accessed occur errors and relevant articles are not available full paper. Future research can also expand the search for articles on other websites/portals to increase the development of research on *carbon tax*.

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