

IMPACT OF CARBON TAX ON THE ECONOMY, TOURISM AND FLIGHT SECTOR

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ABSTRACT

A carbon tax is a type of tax imposed on emissions resulting from the burning of fossil fuels. This study aims to determine the impact of a carbon tax on the economy, tourism, and aviation sectors. The method used is a review of articles on the topic that has been taken. The study results show that the economic sector has positive and negative effects, which can be a new income for the country and a decrease in GDP. The tourism sector will have a positive and negative impact if the demand for tourism continues to increase. It will be able to open new jobs, and the surrounding environment will also have an impact. The aviation sector has a negative impact because it can change customer decisions due to increased prices charged to all customers.

Keywords: **carbon tax, economy, tourism, flight sector**

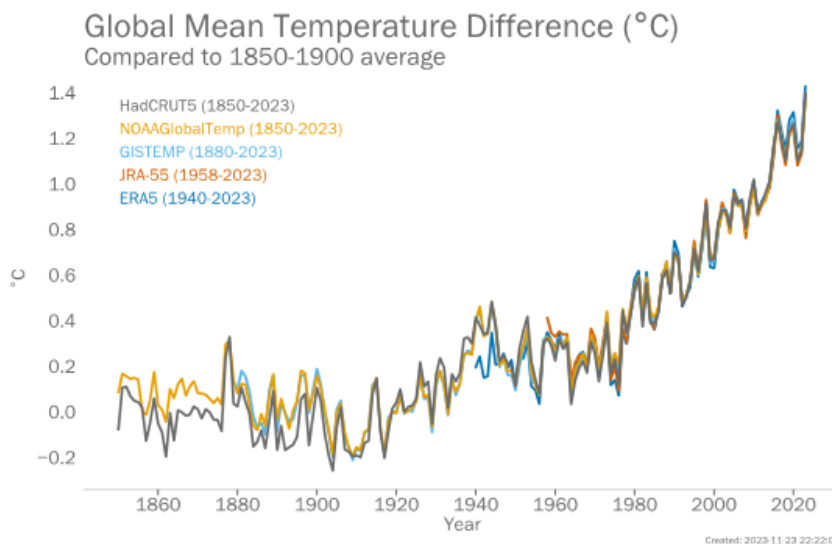
INTRODUCTION

A carbon tax is a fiscal policy implemented by governments to reduce greenhouse gas emissions by imposing additional costs on activities that generate carbon emissions. The purpose of a carbon tax is to encourage the reduction of greenhouse gas emissions by making activities that contribute to climate change more expensive, thereby encouraging companies and individuals to switch to cleaner and more environmentally friendly energy sources. Carbon taxes can also be used to cover environmental protection programs and renewable energy development. A policy tool to reduce greenhouse gas emissions, including carbon dioxide (CO₂), is carbon pricing. These are emissions from burning fossil fuels to generate electricity, fuel vehicles, make materials and goods, and heat and cool the environment. Climate change is caused by these emissions, leading to floods, rising sea levels, heat waves, droughts, and other losses that harm society.

The purpose of carbon pricing is to internalize the environmental costs associated with carbon emissions into economic activities. By putting a price on carbon emissions, the government hopes to encourage the reduction of greenhouse gas emissions by encouraging companies and individuals to implement more environmentally friendly

practices. In addition, carbon pricing can also be a source of revenue for the government that can be used to fuel environmental protection programs, renewable energy development, and other initiatives related to climate change.

Average global temperatures will increase by about 1.4 degrees Celsius by 2023, according to the World Meteorological Organization (WMO). Current global temperatures are just 0.1 degrees below the 1.5 degrees Celsius limit set by the Paris Climate Agreement



in 2015. The WMO estimates that between 2023 and 2027, Earth's average surface temperature will rise to 1.5 degrees above pre-industrial levels that occurred between 1850 and 1900.

The hottest for the past nine years was from 2015 to 2023. As El Niño typically has the greatest impact on global temperatures after it has peaked, a warming El Niño event, which occurred in spring in the Northern Hemisphere in 2023 and progressed rapidly during the summer, is likely to trigger more heat in 2024.

Figure 1. Global Temperature Increase. WMO 2023

Greenhouse gas levels, global temperatures and sea level rise are at record highs. Antarctic sea ice reached its lowest point in history. Prof. Petteri Taalas, Secretary General of the WMO, stated, "These are deafening records."

Carbon dioxide levels have increased half as much as the pre-industrial era, trapping heat in the atmosphere. Temperatures will continue to rise as CO₂ ages. Due to continued ocean warming, melting glaciers and ice sheets, sea level rise in 2013-2022 is more than double that of the first decade recorded by satellites (1993-2002).

To address climate change, which continues to increase as the years go by, the Indonesian Government issued a Carbon Tax. The carbon tax in Indonesia is regulated in Law Number 7 of 2021 on Harmonization of Tax Regulations (HPP Law). The carbon tax rate is Ro 30,000/ton CO2 Equivalent.

The Indonesian government established a carbon tax as a solution to the carbon emission problem. However, the law only regulates the overall tax imposition, not the mechanism. As a result, carbon taxation in Indonesia is considered ineffective.

The Indonesian government will implement the carbon tax in 2025. There are several sectors such as transportation and other types of businesses. That means the economy, tourism and aviation sectors will also be involved in the implementation. Economic conditions in each country are different but in terms of impact they are not that different. Tourism will also have an impact on the increase and decrease. On flights will experience a negative impact on customers. For this reason, this research will discuss the impact of carbon tax implementation on the economy, tourism and aviation sectors.

METHOD

The research method used in this article is to review articles on the impact of carbon tax implementation on the aviation sector and the financial sector. The results of the research will be used as a basis for consideration in the sector on the imposition of carbon tax and how it impacts.

RESULTS AND DISCUSSION

Tax collection is based on the amount of emissions that have been released from a production. In the current era, tourism trends are showing an increase, especially for people traveling by plane. The government imposes a carbon tax on ticket and fuel prices to reduce the negative impact on the aviation environment (Banjarnahor et al. 2021). Two government schemes to reduce carbon emissions are cap and trade and cap and tax, according to the Tax Harmonization Law. If an entity's emissions exceed the cap limit, they must purchase an emission permit from the emitting entity or buy a certificate of the emission's derivative. On the other hand, if the emitter is unable to purchase permits or certificates, emissions above the cap will be subject to a carbon tax. The rate imposed in the law is still relatively low.

The Environmental Kuznet Curve is a commonly used theory to explain how economic activity leads to increased carbon emissions. According to this theory, increasing economic activity in the industrial sector indicates that a country is entering the industrial era, but does not pay attention to the impact of environmental degradation due to the

exploitation of natural resources and increased use of fossil fuels in industrialized areas. The country experiences negative impacts on environmental degradation along with the speed of its economic growth.

ECONOMIC SECTOR IMPACT

A research study conducted by Herald Winkler and Andrew Marquard (2011) analyzed the economic implications of a carbon tax in South Africa, with results suggesting that a carbon tax could be an effective option for climate change mitigation in South Africa. The study shows that the effectiveness of a carbon tax can increase as the tax level gets higher. South Africa could consider taxes starting at R100-200/t CO₂eq, with possible increases in the future. It is important to design a carbon tax carefully to be effective in achieving the goal of reducing greenhouse gas (GHG) emissions. Appropriate pricing and adjustment mechanisms will ensure desirable boundaries on the road to emissions reductions. Equity also needs to be considered so that poor households are protected from the tax burden. Balancing incentives such as food subsidies or VAT reductions on essential goods can help the poor and ensure the net benefit of the tax and incentive package. With proper design, a carbon tax can be an effective instrument in climate change mitigation and also contribute to socio-economic goals in South Africa.

Nyahuna and Doorasamy (2022) This study was conducted to examine the impact of carbon taxes on the financial sustainability of cement and mining companies in South Africa. The results showed that carbon tax has a negative effect on net profit margin, which means it also has a negative impact on shareholder dividends. These findings are important for policymakers to consider the impact of carbon pricing policies on the profitability of cement and mining companies in South Africa. This research provides an opportunity for policymakers to design policies that can mitigate the impact of carbon taxes on corporate financial performance in South Africa.

Cheng F. Lee et.al (2008) analyzed the impact of combining carbon tax with emissions trading, the results showed that carbon tax will reduce the GDP value of petrochemical industry by 5.7% from 2011 to 2020. However, if the carbon tax is applied together with emissions trading, the total reduction in GDP value will only be 4.7%. Moreover, since the downstream sector cannot achieve their emission targets, they will have to purchase additional emission permits. In contrast, the upstream sector benefits from emissions trading.

Le Luo (2014) investigated the impact of the proposed carbon tax on the financial markets of firms in Australia. The study found that the tax has a negative impact on overall shareholder wealth, with the most significant effects occurring in the materials, industrial

and financial sectors. A firm's direct exposure to carbon is associated with abnormal returns, while indirect exposure has no effect as it is not included in the tax. The introduction of a carbon tax in Australia is considered a significant social and economic restructuring event, and this study provides insight that investors will penalize companies with high direct operational emissions. In addition, corporate carbon policies in Australia appear to be inadequate in addressing the negative impacts of the carbon tax. This understanding may encourage management to take proactive measures to reduce the cost of compliance with carbon legislation.

Research on potential state revenue has been conducted by Pratama et.al (2022) where this study predicts how the implementation of carbon tax will impact on potential state revenue and carbon emission reduction in Indonesia. The study found that a carbon tax imposed could generate potential carbon tax revenue from the energy sector worth IDR 23.651 trillion in 2025. In addition, the data shows that the imposition of carbon tax reduces emissions in some countries.

The effect of disclosure of carbon emissions, corporate governance and financial performance of a study in Indonesia conducted by Safutri et.al (2023) the results show that disclosure of carbon emissions has no impact on the company's financial performance, that the management structure significantly improves financial performance, and that the ownership structure has no impact on financial performance.

From previous research, it can be concluded that the impact of the economic sector is very broad. Positive and negative impacts where it can be a new source of income and there is a decrease in GDP and a decrease in the wealth of shareholders because the carbon tax is like a punishment for the company for the emissions that have been issued. And should pay more attention and consider what mechanisms will be used to achieve a stable economy and minimize the negative impacts that exist.

IMPACT OF THE TOURISM SECTOR

Unathi Sonwabile Henama (2013) examined how the tourism sector has positive and negative impacts on the environment. The result is that tourism can create many job opportunities and generate good foreign exchange earnings. However, the industry can also damage the environment. Increased awareness of the importance of preserving the environment can help reduce these negative impacts. The tourism industry can also be a significant source of tax revenue for the government. Researchers also found that the aviation sector is an important part of the tourism industry as it improves access to destinations. However, increasing taxes and operating costs of flights can affect the growth

of this industry. Carbon regulations can also have a negative impact on the aviation industry as it removes necessary financial resources.

Richard S.J. Tol (2007) examined the impact of carbon tax on international tourism. The research shows that carbon taxes only affect the travel actions of tourists. A global carbon tax of \$1000/t C would only reduce international aviation carbon dioxide emissions by 0.8%. However, short-haul and long-haul flights will be greatly affected. Destinations that rely on short-haul or intercontinental flights could see a decline in the number of foreign tourists. Travelers are likely to choose destinations closer to home if the tax is only applied in the EU. This suggests that a carbon tax on aviation fuel could have a significant impact on the travel patterns of international tourists.

From the description that has been done by previous researchers, the tourism sector certainly has an impact in line with the implementation of carbon taxes. The tourism sector can influence the act of travel that will be carried out. If the demand from tourism continues to increase, it will be able to open up new jobs, and this can also be a negative factor for the environment because of the destruction of the surrounding environment.

AVIATION SECTOR IMPACT

The International Energy Agency (IEA) states that the aviation sector accounts for more than 2% of CO₂ emissions. The decline seen between 2008 and 2009 is evident from the data attached. In 2008, CO₂ emissions from international aviation reached 454.44 million tons/mt, dropping to 433.24 million tons/mt in 2009. From 298.14 meters to 279 meters in domestic flights. After that, emissions tended to increase. 2018 and 2019 were the best years. In 2018, international flights produced 609.42 kilograms of CO₂ and 618.82 kilograms of CO₂ in 2019, while domestic flights produced 408.40 kilograms of CO₂ in 2018 and 417.01 kilograms of CO₂ in 2019. In 2020, international flights produced 299.06 kilograms of CO₂ emissions and domestic flights 287.24 kilograms. The IEA also suggests regulation, investment in sustainable fuels and developing alternatives for battery-powered and hydrogen-powered aircraft.

International and national climate policies for aviation discussed by Jörgen Larsson et.al (2018) show that in 2016, the International Civil Aviation Organization (ICAO) decided to implement the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and in 2017, the European Union decided to make faster emission reductions in the Emissions Trading System, which has covered the aviation sector since 2012. For the sample country Sweden, the analysis shows that carbon emissions are expected to be reduced by -0.8% per year if there are emissions reductions in other sectors associated with the EU ETS and CORSIA. This is much lower than the figure needed to

reach the 2°C target. EU member states impose a distance-based air passenger tax. By raising ticket prices, these taxes reduce demand for air travel, thereby reducing emissions.

Research conducted by Hideki Fukui and Chikage Miyoshi (2017) examined the impact of aviation fuel tax increases on reducing fuel consumption and carbon emissions in the US aviation industry. The results showed that the short-term price elasticity of jet fuel consumption, which varied from 0.350 to 0.166, and the long-term price elasticity, which varied from 0.346 to 0.166, could potentially reduce fuel consumption. However, the reduction in fuel consumption and CO₂ emissions will be smaller in the long run. A 4.3-cent increase in the aviation fuel tax is expected to reduce CO₂ emissions in the US by about 0.14-0.18% in the short term (1 year after the tax increase). However, in the long run (3 years after the tax increase), the percentage reduction in CO₂ emissions will decrease to about 0.008-0.01% due to the rebound effect. The results of this study have implications for policy development to reduce carbon emissions in the aviation sector.

Simon et.al (2013) discuss the impact of a hypothetical carbon tax on commercial aviation operations in the United States. Through simulations, the authors evaluated the effect of a tax similar to Australia's carbon pricing system on flight costs. The results showed that the implementation of this tax resulted in an increase in flight costs. Furthermore, the authors used an econometric model to estimate the impact on seat supply, flight frequency, and aircraft types used by airlines. Then, the authors analyzed the schedules generated by the National Airspace System and evaluated the operational performance of flights before and after the tax, focusing on average delays. In addition, the authors also used a model that measures fuel burn and emissions based on flight trajectories to estimate the changes in environmental impacts due to schedule adjustments by airlines in response to the carbon tax. Based on this research, the results show an average reduction in CO₂ emissions of between 0.52% and 0.94% over the two quarters modeled.

Intan Pandini and Hwihanus (2023) conducted research on how the carbon tax affects aviation as well as business continuity and ticket price passenger decisions. The results show that there is a relationship between carbon tax and business continuity, if companies pay carbon fees, they will lose more money. As a result, ticket prices rise, which impacts passenger decisions as high ticket prices will reduce demand.

In terms of the aviation sector, it will have a negative impact. There is a consideration of customers' decision to use airline services because all costs will increase and be passed on to customers. However, demand will still increase because the aviation

sector is indeed one of the transportation used over long distances. This impact is also experienced in the tourism sector because they also travel using flight mode.

CONCLUSION

This study aims to determine the impact of the carbon tax on the aviation sector and the financial sector. The research results show:

a) The economic sector will experience positive and negative impacts because it is a source of income and a decrease in GDP shown by the results of research by Herald Winkler and Andrew Marquard (2011), Nyahuna and Doorasamy (2022), Cheng F. Lee et.al (2008), Le Luo (2014) Pratama et.al (2022), Safutri et.al (2023).

b) The tourism sector has a positive and negative impact from the act of travel to be carried out and the damage to the environment is approximately shown by the results of research from Unathi Sonwabile Henama (2013), Richard S.J. Tol (2007).

c) The Aviation sector will experience a negative impact because it affects customer decisions and increases the price that is fully charged to customers as shown by the research results of Hideki Fukui and Chikage Miyoshi (2017), Simon et.al (2013), Intan Pandini and Hwihanus (2023).

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