

The Impact of EU Carbon Border Adjustment Mechanism: Perspective from Developed and Developing Countries

Xiaorui Peng^{1, *}

¹Department of Economics, University of California, Irvine, the U.S.

*Corresponding author: xiaorup@uci.com

Abstract. In recent years, the environmental problems which have a direct effect on the daily life and health triggered by human activities are gradually being exposed. Exploring sustainable development becomes the priority. In December 2019, European Union proposed European Union Carbon Border Adjustment Mechanism – Carbon border adjustment levy imposed on some European Union imports, included imported iron and steel, aluminum, fertilizers, and electricity, etc. If this policy is formally implemented, it will inevitably have an impact on the global import and export trade pattern, especially in some major exporters of carbon-intensive products. This paper presents a systematic analysis of the impact of EU CBAM on developed and developing countries. The results show that developed countries are relatively less vulnerable to EU CBAM due to earlier implementation of environmental protection policies and similar carbon pricing levels to the EU. In contrast, poor carbon policy environment and slow development of low-carbon technologies and carbon trading markets is inescapable presences in the developing countries, so the impact is greater. Under the challenge of EU CBAM, it is suggested that all countries accelerate the pace of promoting the construction of carbon emission trading market and a sound carbon pricing system. At the same time, help enterprises to make green transformation and find diversified international trade policies.

Keywords: European Union Carbon Border Adjustment Mechanism, European Union, carbon leakage.

1. Introduction

1.1 Research Background

Since the beginning of the 21st century, global warming and its serious damage to human beings have been widely discussed by the world. People are experiencing massive climate change caused by our own hands. Climate change and global warming have always been inescapable social event. Fossil minerals are burned to generate energy and massive deforestation is used for burning and construction, producing large amounts of carbon dioxide and other greenhouse gases in the process. These greenhouse gases are like the glass cover of the greenhouse. They do not affect the radiation of the sun to the surface of earth, but they can block the infrared radiation reflected from the ground back to the upper sky. Therefore, the temperature increases and produce greenhouse effect. Carbon dioxide (CO₂) concentrations in the atmosphere are now higher than they have ever been in the previous 400,000 years. For the first time in recorded history, CO₂ levels topped 400 ppm in 2013. This recent unrelenting increase in CO₂ is strongly related to the burning of fossil fuels and is easily explained by the straightforward assumption that around 60% of emissions from burning fossil fuels remain in the atmosphere [1]. This is no doubt that carbon dioxide emissions are the culprit behind climate change. CO₂ will continue to grow to levels of around 1500 ppm if fossil fuel combustion proceeds at the same rate it has been, depleting the reserves over the next few millennia. If this were the case, even tens of thousands of years in the future, the atmosphere would not return to pre-industrial levels [1]. Controlling human-induced climate change unsuitable for human and enforcing strict environmental and climate policies are crucial. Human beings have been constantly exploring how to improve climate conditions. Carbon tariff and Carbon Border Adjustment Mechanism are the vital product.

1.2 The Development of Carbon Border Adjustment Mechanism

European Union Carbon Border Adjustment Mechanism (EU CBAM) also known as carbon tariff, which refers to base on implementing strict domestic climate policies, requiring imported or exported products with high carbon emissions to pay or refund corresponding taxes or carbon quotas. The discussion about EU CBAM has been around for a long time in different countries, but it has not been put into action. Currently, the European Union (EU) mentioned EU CBAM again and actively pushes for relevant legislation.

As early as December 2019, the EU launched the Green New Deal and proposed EU CBAM plan. In March and September 2020, the European Commission submitted the EU CBAM impact assessment report, announced the inclusion of EU CBAM in the 2021 legislative proposal and included EU CBAM in 2030 Climate Target Plan. The European Parliament voted for the first time on the draft EU CBAM in March of 2021 and passed a resolution calling for the creation of a carbon border adjustment mechanism that is WTO-compliant. And in July of the same year, the European Union announced the European Parliament version of the EU CBAM proposal. A transitional period from January 2021 to January 2026, during which only reporting obligations will be imposed on importers. According to Commission CBAM Proposal, Article 31(<https://ec.europa.eu>), beginning in January 2026, importers will have to purchase "CBAM certificates" for the products they bring in in amounts that reflect the embedded emissions of those products and the ETS price. The Commission also suggested that the EU CBAM should encompass imported iron and steel, aluminum, fertilizers, and electricity. On May 17, 2022, the adjustments to the EU CBAM were adopted by the Committee on the Environment, Public Health, and Food Safety (ENVI). Changes include broader scope of product, adding the industries of hydrogen, polymers, and organic chemicals and wider scope of emissions, the calculation of embedded emissions in products includes both direct emissions and indirect emissions. In addition, the deadline for the transition period has been brought forward by one year, and the time for full implementation of EU CBAM has also been brought forward from 2035 to 2030. Then, on 22 June 2022, the European Union Parliament voted to adopt its position on the EU CBAM.

1.3 Carbon Leakage

Carbon Leakage is the main fuse of EU CBAM. It is made for avoiding offsetting the efforts of European Union to reduce greenhouse gas emissions during importing the goods which are produced in non-EU countries. Carbon Leakage is mainly caused by two motivations. One is price motivation. The emission reduction actions by countries with climate ambitions may lead to lower world market prices for carbon-intensive fossil energy sources such as coal and oil, thus less ambitious countries may increase the demand for fossil fuel. Besides, carbon-mitigation policies may augment the cost of carbon-intensive products, giving countries without emissions reduction actions comparative advantage in the production of similar products. The international market structure and international trade flow may therefore be changed. The second one is industrial shift motivation. The carbon-mitigation policies may lead to the growth of cost of production and decrease the production of production factors, such as capital, technology in energy-intensive industries. Therefore, the enterprises and multinational firms in the countries with emission reduction policies may shift investment to non-mitigation countries to max the profits [2].

1.4 Research Significance

Recently, the EU is rapidly advancing carbon tariffs, which are closely related to EU import and export trade. Once this policy is implemented, it will have an impact on the EU-related trade map and even the world trade pattern. Therefore, this paper aims to explore the development of EU carbon tariffs and their impact on countries. Each country can adjust own policies in advance according to its own national conditions to reduce the vulnerability of its own country to this policy.

2. The Attitude of Countries and Effects of EU CBAM

2.1 The Attitudes of Developed Countries

Most developed countries or regions, such as countries from European Union, the United States, Canada, Japan, Europe and so on are supportive or open to EU CBAM. They are expected to form a consensus on carbon tariffs, with a high likelihood of collective action on carbon-mitigation policies. On July 19, 2021, the United States proposed its own carbon border tax plan on countries' Greenhouse Gas Emissions. In order to prevent "carbon leakage", it plans to impose carbon tariffs on iron, steel, and other imports from countries without ambitious climate laws. The White House did not respond directly to a request for comment on the bill, nor did it say whether the administration supports the bill, but the Biden administration has been keen on climate diplomacy since taking office, and said they support a carbon border tax as a tool to advance climate goals. U.S. Republican Senator Kevin Cramer said they would support Democrats' plans for a carbon border tax if coordinated with other wealthy nations in May of 2022. The United Kingdom is also taking a positive approach to EU CBAM. The UK government states its desire to collaborate closely with low- and middle-income nations and to align any ensuing policy on product standards or EU CBAM with consumer interests [3]. The purpose of the UK is consistent with the EU. The main goal of implementing a EU CBAM would be to address the risk of carbon leakage in the UK industrial sectors affected by the developing UK Emissions Trading Scheme (UK ETS) and so on, switching to foreign production of those goods in order to avoid the additional costs associated with compliance with the UK ETS that are passed through by the UK operators [4]. Similar situation in Canada, they are exploring the introduction of EU CBAM, with the aim of starting a global conversation about the mechanism. Japan announces long-term goal of carbon neutrality by 2050 in October 2020. In April 2021, the medium-term goal of reducing greenhouse gas emissions by 46% in 2030 compared with the 2013 carbon peak was proposed [5]. To this end, the Japanese government has drawn up an overall plan for clean energy, green finance, and the transformation of electric power in the whole industry. For the domestic market, Japan assigns a certain price to carbon emissions, prompting carbon emitters to reduce emissions with global warming countermeasure taxes, carbon emissions trading and credit trading. At the same time, the Japanese government, and non-governmental organizations such as Keidanren is proposing to promote the cross-border carbon pricing mechanism in order to respond to the EU CBAM and take the dominance in the formulation of international rules.

2.2 The Effects of EU CBAM on Developed Countries

In the context of global cooperation on climate change, the EU unilaterally promotes the implementation of the Carbon Boundary Adjustment Mechanism. Then many developed countries such as the United States, Europe and Japan actively seek further cooperation and exploration with EU CBAM and try to introduce similar green trade barrier policies, whether for the purpose of environmental protection or to gain a voice in the early stage of global environmental protection trade. The imposition of carbon tariffs on imported goods may have a certain impact on the global trade pattern and related industries [6]. EU CBAM not only provides the EU and other ambitious countries with tools to accelerate the decarbonization of related high-carbon industries and incentivize or force the reduction of carbon emissions, but also an effective means to avoid carbon leakage. For developed countries, EU CBAM serves as a mechanism to protect local carbon-intensive products in the international competition. It reverses the price disadvantage of the growing climate ambitions of some major powers, led by the EU and mitigates their loss of international competitiveness due to the environmental protection policies. Heavy taxes decrease the foreign supply, thereby stimulating the local production and increasing the domestic price. From the pattern of carbon-intensive products trading partners, the major developed country exporters, especially countries from EU and border with EU have similar carbon price levels as EU, mainly because they participate in or cooperate with European Union Emissions Trading System (EU ETS). Therefore, they are minimally negatively affected by the policy.

2.3 The Attitudes of Developing Countries

Conversely, many developing countries accuse EU CBAM of unilaterally restricting trade. China, Russia, South Africa, Brazil, Chile, India, and many other developing countries are opposed or cautious about this policy. The most common query to EU CBAM comes from the Technical Barriers to Trade (TBT) Agreement, which may violate World Trade Organization (WTO) agreements. The disputes mainly focus on the principle of non-discrimination, the national treatment rule, tax restrictions and the applicability of exemption clauses and so on [7]. On November 16, 2020, Zhenhua Xie, special adviser on Climate Change Affairs of the Ministry of Ecology and Environment of China, said that China is willing to actively cooperate with the EU to promote Economic policies for green, low-carbon and circular development, and strive to complete the negotiation of relevant clauses of the Paris Agreement. However, it also made it clear that it does not approve of the carbon border adjustment mechanism, and there are still doubts about the effectiveness, legitimacy, and technical complexity of the mechanism.

2.4 The Effects of EU CBAM on Developing Countries

By imposing tariffs on countries that export carbon-intensive products, EU CBAM, in theory, prevents carbon leakage and mitigates the impact of domestic climate policies on a country's reduced competitiveness in international trade. However, falling demand for imported products could shift the negative pressure of climate policy from developed countries with climate-ambitious to developing countries. According to the data, the top ten developing countries which Exports to the EU in EU CBAM sectors are Russian Federation (16.7%), China (10.1%), Turkey (6.8%), Ukraine (5.2%) and India (4.2%). More than a quarter of trade is accounted for by the top two countries, China, and Russian Federation. For these two countries, iron and steel are the largest carbon-intensive products exported to the EU at 5,245.6 million and 5151.5 million dollars respectively [8]. The CICC Research Institute divided the reduction in GDP by the reduction in global carbon emissions before and after the implementation of EU CBAM and concluded that the global cost of emission reduction after EU CBAM is implemented is about \$88 per ton of carbon dioxide [9]. Rising prices will cause some price-advantaged developing countries being squeeze trade by international markets such as the EU in trade of carbon-intensive products. It will have an impact on the trade pattern and the export share of each country. The exports of Russia to the EU will drop by 10.31%, and mainland China will drop by 6.9% due to EU CBAM [9]. In response, affected countries will actively adjust their production structures and seek new buyers for carbon-intensive products. They are likely to turn their attention to some newly developing countries. It is important to note that some low-income developing nations which have heavy dependence on EU CBAM sectors are more significantly affected by EU CBAM. It is difficult for them to implement environmental protection policies in the country and to promote low-carbon technologies and achieve green production due to slow economic growth and lack of talent.

2.5 Comparative Between Developed Countries and Developing Counties

Developed countries have generally implemented strict environmental protection policies and similar mature carbon pricing systems and have also taken a step ahead in low-carbon production technology. This makes them exempt from EU CBAM, such as Norway and Switzerland whose domestic systems are modeled closely on the EU ETS. The United Kingdom has also been actively exploring and trying to launch its own ETS. The global warming countermeasure tax, carbon emission trading and credit trading policies implemented in Japan have also been relatively mature. However, the progress of the emission-limiting policies and low-carbon production technologies for carbon-intensive products is still slow for some developing countries. According to the data from The World Bank, China national ETS is 9.20 US dollars/tCO₂e, Indonesia carbon tax is 2.09 US dollars/tCO₂e and Ukraine carbon tax is merely 1.03 US dollars/tCO₂e, in contrast to the carbon tax of Sweden of 129.89 US dollars, UK ETS of 98.99 US dollars and Norway of 87.61US dollars/tCO₂e by April of 2022 [10]. Imports and Exports from developing countries decrease as a result of an EU CBAM in

favor of developed countries, which frequently have less carbon-intensive production methods. Under the measure of CGE model, as for the indicator of GDP, the implementation of EU CBAM will have no impact on the developed countries such as the United States, the United Kingdom and Switzerland. Even it will bring a growth of 0.04% - 0.18% to the import and export trade of these countries yet developing countries will suffer dramatic decline in this dictator. Mainland China will decrease 0.54% in import share and drop 0.29% in export share. As the largest import and export trade country of EU, Russia will be even worse (-1.90% in import and -0.37 in export). It will also see a drop on GDP in mainland China and Russia, -0.01% and -0.05% respectively [9].

3. Suggestions

Global carbon reduction will be the future development trend. EU CBAM is not only a milestone in the process of sustainable development but has also set off a global upsurge in energy conservation, emission reduction, and environmental protection. In order to reduce the impact of the global carbon emission mechanism, countries are exploring their own carbon policy plans, seeking cooperation with other countries, and trying to grasp the first advantage. Designing appropriate policies to address challenge of EU CBAM becomes a recent preoccupation for all the countries. The possible policies can be analyzed at the national and enterprise levels.

In the level of the whole country, firstly, the country should increase the promotion of the construction of its own carbon emission trading market, and quickly establish its own mature and standardized carbon pricing system. Narrowing the gap with the international carbon price and improving its own carbon competitiveness. Next, the country should adjust the export market structure of carbon-intensive products which covered in EU CBAM. Trying to find diversified international trade policies - increase the share of exports to emerging developing countries, improving own resilience. Thirdly, establishing country own national carbon border regulation system can mitigate the impact of unilateral trade tariffs. This policy can compensate the country for the paying of extra carbon tariff. Raising the international voice and strength about carbon and finding the possibility of the reductions and exemptions of carbon tariff are the priority.

It is not only a foreign policy between countries, but also requires close cooperation between countries and enterprises. It is important to improve the enthusiasm of enterprises and maintain a high degree of synchronization between the country and the enterprise. Subsidizing and encouraging research and development of low-carbon technology and zero-carbon technology products – improving fossil energy utilization and reducing emissions intensity. At the same time, establishing strict carbon emission detection and limit values for enterprises. Emphasizing corporate social responsibility and the awareness of low-carbon environmental protection.

4. Conclusion

Since the EU proposed the EU CBAM plan in December 2019, there has been heated discuss about the topic of carbon tariffs and carbon pricing. Its proposal not only made the world begin to pay attention to environmental protection and low-carbon production and lots of big countries, such as Japan and the United Kingdom start to consider their own environmental trade policies, but also made many countries fear that the world trading system and industrial structure will be changed. In this case, it is particularly important to explore the main policies behind EU CBAM and the impact on various countries. However, each country has different national conditions and trade structures, so the impact of CBAM is different. Therefore, in order to better discuss the actual situation, this article discusses the possible impact according to the two situations of developed countries and developing countries based on the principle of category discussion. It also explores the feasible policies of the whole nation and downstream enterprises. Although this article divides countries into developed and developing countries for discussion, only some representative major countries with close trade relations with the EU were selected. The national conditions of each country are very different and

complicated, so there are still many cases of small countries that are ignored. Future research should be more global.

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