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The European Union's CBAM: Is It an Effective Economic Climate Policy?

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Introduction

Carbon taxes are utilized as a tool to address the negative externalities of carbon emissions from production. However, as countries begin to price carbon and create additional policies that address environmental damage, the issue of “carbon leakage” has emerged. Instead of reducing pollution as intended, products produced domestically are instead replaced with more carbon intensive imports (European Commission Taxation and Customs Union, 2021). This essentially reduces the effect of carbon pricing and makes environmental regulations less effective.

To combat this, the European Commission announced a proposal on July 14, 2021, to create a carbon border adjustment mechanism (CBAM). This carbon border tax aims to prevent carbon leakage and increase accountability worldwide for environmental degradation by equalizing the price of carbon in the EU (European Union) with that of imports.

However, the potential outcome of this policy is a highly controversial topic among economists, policymakers, and environmentalists. Some economists assert that this border tax could disrupt global trade and potentially start trade wars, while others question the proposal’s legality under WTO (World Trade Organization) laws. Those in favor argue that this mechanism would prevent carbon leakage and would lead to additional environmental regulations worldwide.

This paper argues that a carbon border tax is likely to succeed in the goal of reducing carbon emissions if regulated and enforced properly. However, some evidence demonstrates consumers and producers could face additional costs in the short term as a period of disruption could occur in the trade sector, while also shifting the carbon price burden onto developing countries. Therefore, the EU should continue with this program but ensure that a gradual transition occurs, giving manufacturers in other countries ample time to address additional costs and reduce emissions, while also ensuring that clean technology is accessible to developing countries. If successful, the EU should also advocate for other large importer countries, such as the US, to utilize a carbon border mechanism in order to increase the policy’s effectiveness.

This paper will first discuss how carbon pricing aims to fix market failures that occur due to emissions in production before outlining the current system and proposal by the EU. The paper will then delve into a thorough literature review to illustrate the arguments from those in favor and against this proposal before offering the authors suggestions.

Background on Carbon Pricing and the European Proposal for a Carbon Border Adjustment Mechanism (CBAM)

Carbon pricing aims to fix the market failures that occur due to the negative externalities of production. According to basic economic principles, producers set the price and quantity of goods at the level where the quantity of the goods supplied meets the quantity of the goods demanded. When a firm produces goods that use fossil fuels, the resulting pollution is an added cost to society that is not accounted for in the production costs and therefore the supply curve. This results in market failure as firms will decide the quantity to produce based on the private costs (the costs to the firm) and not social costs (the costs to the firm as well as the additional costs to the community that occur). In other words, a firm that will produce more than the optimum amount. Carbon pricing aims to fix this using a market-based solution. By pricing carbon, the costs to the firm increases, shifting the supply curve and leading to a lower amount of goods produced. Using the above economic principles, this would result in the firm producing the socially optimal quantity of goods (Center for Climate and Energy Solutions).

A carbon tax can take the form of either an emissions tax per unit of carbon emitted or a tax on goods that are emission-intensive, such as a tax on gasoline (Center for Climate and Energy Solutions). Carbon pricing also encourages firms to reduce their greenhouse gas production to lower their cost. Firms might also switch to more renewable energy for production or adopt new technology that reduces emissions. It is important to note that a cap-and-trade program also aims to address emissions in production but accomplishes its goal by capping the amount of carbon emitted and allowing firms to trade allowances at a price set by the market (Center for Climate and Energy Solutions).

The EU currently has both a region-wide cap and trade system and the ability for individual member states to levy an additional carbon tax. The EU's cap-and-trade program (referred to as the Emissions Trading System or ETS) allows the market to set the price of carbon while the EU slowly decreases the "cap" of carbon permitted for production. The current price of emissions (paid by securing permits to pollute) is \$60 dollars per ton (Plumer, 2021). Currently, most industries in the EU, including electricity production are required to participate in the program. Although many countries in the EU such as France and Spain (European Commission, 2021) have their own additional carbon taxes on goods such as gasoline, this paper will focus on the expansion of the EU's policies and not individual countries' policies, to create a view of the impact of the CBAM in a more concise manner.

The EU has recently announced that it is planning on decreasing the cap on carbon even further in order to reduce greenhouse gas emissions to 55 percent below 1990 levels by 2030. The EU also has plans to stop giving out free trade allowances and to tighten the cap even further, raising the price of carbon

(Plumer, 2021). This will force manufacturers to take even more costly measures to reduce emissions or be compelled to raise their own price if they continue to emit at the same level.

There is a concern that EU firms will be at a competitive disadvantage in their own markets due to the increased cost of production. This decrease in comparative advantage could have two consequences: EU firms will take their production overseas where carbon pricing policies do not exist to reduce production costs and remain competitive, or EU products could be replaced by more carbon intensive products imported from other countries. This phenomenon is called “carbon leakage” (European Commission, 2021). Despite the EU’s aim to reduce emissions, globalization and the large number of products the EU imports could cause manufacturing to shift from one country to another. Therefore, consumer products purchases may be produced using *more* carbon emissions, not less as the policy intends.

The EU’s solution to “carbon leakage” and the potential disadvantage domestic producers face is to create a Carbon Border Mechanism Adjustment (CBAM) that equalizes the price of carbon for both imported goods and goods produced domestically. Essentially an import tax on the amount of carbon that is emitted when creating goods, the CBAM will require reporting of emissions for every imported item. Countries looking to export goods to the EU will then buy carbon certificates corresponding to the current carbon price in the EU. The ETS, rather than the countries themselves, will set the price of carbon. It is important to note that even though the price of carbon will be equal to the price of carbon in the EU ETS market, firms that are exporting to the EU will *not* participate in the cap-and-trade system currently in place (the ETS market). Countries do not have the option to trade certificates with other firms; the CBAM is a carbon tax or a cap-and-trade program.

The proposed system also allows EU importers to have the opportunity to prove a carbon price has already been paid in the production process (European Commission, 2021). For example, a good that is produced in California, which currently has its own carbon pricing, will get the amount paid in carbon pricing to California deducted from its carbon fees to the EU. As this is the first program of its kind, the EU proposes a start date for the program of 2023 in an initial stage where EU importers will have to report emissions, but they will not be charged for them. Initially, the CBAM will only apply to iron and steel, cement, fertilizer, aluminum, and electricity, as they are sectors the EU has classified as high risk for carbon leakage (European Commission, 2021). If successful, the system will be fully operable by 2026 with the border tax coming into effect for these sectors. The European Commission has noted that the CBAM will cover other sectors over time, although it does not specify the timing of this (European Commission, 2021).

Literature Review on Effectiveness of Carbon Taxes Domestically

Although some countries have had difficulty reducing emissions through carbon taxes (Funke and Mattauch, 2018), many have been successful in reducing emissions and raising revenue for other environmental work. More than 40 countries and 20 cities, states, and provinces have now adopted some form of carbon pricing mechanism aimed at reducing emissions (Plumer and Popovich, 2019). Although many countries have implemented some form of carbon pricing, it is important to mention that there is no universal carbon price, although many have argued for one (Plumer and Popovich, 2019).

Sweden has had a successful carbon tax program that decreased emissions without impacting GDP growth. Sweden has one of the longest experiments in the long-term effects of a carbon tax on emissions, being implemented in 1991 (The World Bank, 2014). Although the tax rates on carbon are one of the highest in the world (\$139 per ton of CO₂), the revenue from the tax goes to the general government budget, which allows reduction of other taxes (Funke and Mattauch, 2018). Sweden's initiative has worked; from 2000-2012 the country's greenhouse gas emissions fell 16% while its GDP grew by about 30 percent (The World Bank, 2014). Sweden has demonstrated that GDP can be separated from emissions, and in addition, countries do not need to utilize fossil fuels to achieve economic growth.

Canada has its own national carbon pricing scheme. Still, provinces are allowed to make their own local climate policies that can tax carbon at a higher rate and designate the destination of revenue. Canada's national carbon tax is C\$40 (\$31.45 US) per ton of CO₂, intending to increase it to C\$170 (\$133.68 US) per ton by 2030 (Citizens Climate Lobby, 2021). The scheme remains popular because 90% of the revenue is returned to citizens in carbon tax rebates to be used on electricity bills (Citizens Climate Lobby, 2021). Provinces have made measures that include ensuring that those who are disproportionately affected by the tax are given more rebates and have also ensured that some of the revenue is spent on investments in green technology (Funke and Mattauch, 2018). Canada has also provided an additional incentive for firms to decrease emissions; the tax will rise C\$5 dollars each year after 2030 until emission goals are met (Citizens Climate Lobby, 2021).

Literature Review on the CBAM and Other Carbon Border Tax Proposals

Despite the relatively recent introduction of the CBAM proposal, many economists and other experts have already discussed the feasibility and potential outcomes of a carbon border tax. Critiques of carbon border taxes generally fall under two categories: concerns about the effectiveness and feasibility of the tax, and how other countries and world trade, in general, would be affected. These more general studies can be combined with newer studies on the potential

implications of the CBAM on world trade to create a thorough analysis of some of the disadvantages and challenges some anticipate the EU proposal would have.

Arguments Against

Despite the EU's assurance that the tax would comply with rules of the World Trade Organization (European Commission, 2021), several authors argue that there is a possibility the proposal would be challenged, and other countries affected by the tax are likely to ask the WTO to review the proposal and possible trade disputes. Sam Lowe (2019) points out that carbon taxation is an area that has yet to be tested by WTO law, and the EU would have to ensure that it treats foreign and domestic products the same (p.5). Lowe also points out that the General Agreement on Tariffs and Trade (GATT), which is the predecessor of the WTO, allows a member to "levy an additional tax on imports so long as it is equivalent to the cost imposed on the domestic industry by an internal tax or similar" (p. 5). Therefore, the EU would have to prove an industry producing the same product in the EU and a foreign country would be taxed identically. James Nedumpara and Shiny Pradeep (2021) also discuss the possibility of legality issues with the CBAM, noting the difficulty in taxing emissions, which is a byproduct of the good rather than a tax on the good itself (p. 163).

In addition to these legal issues, some authors also note the difficulty in enforcing this policy. Nedumpara and Pradeep (2021) note that some foreign countries do not have the institutions or government sectors that monitor industries' emissions (p. 164). They argue that even for small firms, it could be difficult to measure carbon emissions accurately and for the EU to confirm them. Lowe agrees with this, noting the additional cost these firms could face if forced to measure emissions accurately (p. 5).

There is also some doubt whether the CBAM would accomplish its goal to reduce carbon emissions. Christoph Böhringer et al (2020) argue that trade flows and structural changes in the economies determine whether carbon border taxes are effective. In their model, which demonstrates the effect of a border carbon tax after the financial crash of 2008, the effects on carbon reduction are "modest" (p. 691). Georg Zachmann and Ben McWilliams (2020) note that countries may use trade deviation and reroute their products to other countries that do not have a carbon tax, limiting the effect on emissions (p. 8).

Other economists are more concerned with the potential detrimental impact on world trade and international markets. Lowe (2019) notes that some countries could see a carbon tax proposal as a protectionist tariff rather than an effort to fight global emissions and climate change (p. 6). He argues that this could lead to escalation and other countries erecting protective barriers making it difficult for the EU to create free trade agreements (p. 6). Zachmann and McWilliams (2020) mention that there has already been pushback from other

countries that are skeptical of the intent behind the proposal, such as from Poland's prime minister (p. 11-12). In addition, the authors suggest that retaliation such as tariffs on automobiles by the US could become an issue (p. 12).

Ben Aylor et al (2020) focus their research paper solely on the possible effects on world trade. The authors are concerned about sourcing decisions that would affect the entire supply chain and whether the industry is directly affected by the carbon tax or not (p. 4-5). Aylor et al are also interested in the effect the CBAM would have on competitiveness as emission heavy products would now be at a disadvantage compared with EU or foreign companies who use less energy to produce their products (p. 7). This could send shockwaves through the trade market. In another model by Aaditya Mattoo et al (2013), decreasing exports from industrial countries such as India and China may be an unintended consequence of a carbon border tax. However, it is important to note that their model is a general carbon border tax, not the CBAM, which only focuses on certain sectors in its initial phase.

Economists also raise some moral questions, particularly the proposal's burden on developing countries. Nedumpara and Pradeep (2021) point to a multitude of international treaties, such as the United Nations Conference on Trade and the Environment, that state a global consensus should be a prerequisite to introducing environmental measures that affect the globe (p. 168). In addition, Nedumpara and Pradeep note that this proposal does not consider differences in emission standards across economies, leading to possible political pushback (p. 171). Zachmann and McWilliams (2020) agree with the notion that there is precedence in international text that developing countries should not face the same mitigation burden, pointing particularly to the United Nations Framework Convention on Climate Change (p. 11).

Arguments in Favor

Despite the critiques outlined above, many economists favor the CBAM proposal and argue it is feasible, legal, and has the potential to make a large impact on emissions globally. Firstly, there is a consensus among many economists that the CBAM is legal under WTO laws and guidelines. Although Morris (2018) wrote his paper prior to the proposal by the EU, he demonstrates that a carbon border tax can be WTO-compliant and points to a specific framework created by Resources for the Future (RFF) and Georgetown University that is both effective and comprehensive and follows the WTO rules (p. 9). Morris notes that a border tax that applies consistently across all countries regardless of their stages in development or emission standards would help ensure that the proposal is WTO compatible (p. 21). Although Morris does not explicitly mention the CBAM, the aspects of the carbon tax he outlines align with the features of the CBAM.

Similarly, Ismer and Neuhoff (2007) argue that border tax adjustments can be created to be compatible with WTO constraints (p.137). Ismer and Neuhoff analyze the relevant sections of GATT and determine that a carbon border tax would not qualify as discrimination against “like products” (Art III. Section 2 of GATT, p. 145). In addition, Ismer and Neuhoff determine that there is no mention of whether taxes or tariffs cannot result in significant distortion in trade flows; the only requirement is that “excessive” charges cannot be placed on like products or substitutions (p. 147). Lastly, Ismer and Neuhoff note that GATT allows measures “necessary to protect human, animal or plant life or health,” and they argue that taxes aimed at reducing emissions and climate change should be justified by that clause (p. 150).

Many experts also believe that the effects on world trade can be reduced through investment in less emission-intensive practices. Acar et al (2021) designed a study that observed the potential effects of an EU carbon border tax on the Turkish economy. The authors begin their study by creating a model where Turkey continues its “business as normal” path of emissions. They find that the impact of the carbon border adjustment would result in a loss of 3-4% of the GDP by 2030 (p. 19).

The authors then adjusted their model to see how Turkey reducing its annual emissions to 481 million tons by 2030 changes the outcome (p. 19). The results are surprising in that the model suggests a carbon border adjustment alongside a reduction in emissions expands industrial production by 6.5% and exporting sectors such as the automotive industry can gain potential output gains of over 60% (p. 24). Therefore, the authors conclude that by taking action to reduce emissions, the carbon border tax can increase social and private welfare in both normal economic terms and improve environmental and health conditions (p. 24). The authors also note that Turkey’s government will have to take a substantial role in transforming the current economy to a more climate friendly one. They recommend creating a cap-and-trade program like the EU ETS to help this process occur before the tax is put in place and thereby minimize economic losses (p. 25). The author's conclusions demonstrate that a carbon border tax may not necessarily result in adverse effects to other countries' economies and global trade if preparatory actions are taken.

A few economists also say that the CBAM could effectively prevent carbon leakage and make a difference to worldwide emissions. Hecht and Peters (2019) use a model of two countries to predict the effects of border adjustments on carbon pricing, and therefore emissions. The model concluded that the addition of a border adjustment increased the average carbon price in both countries (p.105). Hecht and Peters looked at how carbon border taxes affect industrialized countries that are net carbon importers. Hecht and Peters argue that domestic carbon pricing is not normally effective in these countries as they import

carbon intensive goods. However, with a border adjustment tax, the burden of the tax switches from production to consumption, resulting in a carbon price that affects more goods (p. 105). Hecht and Peters argue in favor of a carbon tax to support domestic carbon pricing, although they do mention it is difficult to determine the overall welfare effects of a carbon tax when it is implemented.

Ismer and Neuhoff (2007) agree and argue for carbon border adjustments as an “economically viable approach to address leakage effects” (p. 158). Kuik and Hofkes (2009) hold a slightly different opinion, concluding that a carbon border tax can somewhat reduce some industries’ emissions. They advocate for a tax to be placed on the iron and steel industry as they are particularly carbon intensive, as well as susceptible to carbon leakage (p.1743). The authors’ calculations indicate that carbon leakage in the steel industry, due to the ETS, is 35% (p. 1746). It is important to mention that overall, they argue that a carbon border tax would have modest impacts on carbon leakage. (p. 1747) The first stage of the CBAM, however, will be placed on iron and steel, as well as a few other industries.

Lastly, several authors note the importance of action to demonstrate the seriousness of climate change and the need to act in both developed and developing countries. Kuik and Hofkes (2010) note that a carbon border tax provides a “carbon price signal” that could lead to firms and sectors around the world taking steps to reduce their emissions (p. 1747). Acar et al (2021) highlight the European Green Deal announced in 2019 and its goal to create a climate neutral continent by 2050 (p. 2). By putting in place the CBAM, the EU makes progress towards achieving the ambitious goals laid out in this deal and encourages other countries to take a more active stance on crafting climate policy.

Discussion and Recommendations

After conducting a thorough literature review of the possible implications of carbon border taxes and the EU’s CBAM proposal, the CBAM seems to be an effective policy that is WTO compliant and can set a worldwide standard for carbon pricing and reducing emissions in economic production. The CBAM is not a discriminatory tariff as it applies evenly to every country and matches the carbon price within the EU itself. In addition, the EU has consulted various committees on how best to determine a WTO compliant border tax. The former Director-General of the WTO defined the CBAM as a “precautionary” measure and not a protectionist one (Júlvez, 2021). However, economists are expecting some challenges. But as the GATT allows for some exemptions based on health and environmental reasons, it’s clear that the WTO will uphold these disputes (Júlvez). However, the proposal has some justifiable critiques, especially regarding the effect on developing countries and the global trade market. There

are several steps the EU can take to address these concerns while ensuring that the CBAM will be as effective as possible.

Ensure a Transition Period to Reduce Costs and Supply Shock

The first necessary step is one the EU is already taking: ensuring a transition period is in place to avoid supply shock and increased cost on producers. Aylor et al (2020) had concerns about the effects on the world economy once the border tax is put into place. As Acar et al (2021) discovered, it is imperative for a country to have time to encourage eco-friendly changes of inputs and electricity sources in firms to avoid their economy from being negatively affected by the CBAM. The EU has already created plans for a slow transition to allow for a “careful, predictable, and proportionate transition for EU and non-EU businesses as well as authorities” (European Commission). During this transition period between 2023 and 2026, firms belonging to the sectors initially chosen to be covered (cement, iron and steel, aluminum, fertilizers, and electricity) will have to report annually the emissions in the production of the goods but will not be charged (European Commission). This slow transition will allow countries and businesses time to decide whether it is in their best interest to pay the taxes or transition to cleaner energy.

Put in Place Standardized Emission Calculations and Reduce Administrative Burdens

The EU should also take steps to ensure that the CBAM can be enforced, and that emissions calculated are accurate. Zachmann et al (2020) raises the issue of the situation where companies may object to disclosing details of their operations, including location and emissions output (p. 8). The EU has determined that those exporting to the EU will be able to use default values (calculated by using average CO2 emissions for each product) to determine the number of carbon certificates that will need to be purchased (European Commission). Firms can also retroactively give data for their actual emissions and receive some carbon certificates back. This demonstrates that the EU is thinking about the feasibility of creating a carbon border tax for products produced in various countries. By calculating a set value of emissions for each product, firms can choose to use the default value instead of employing costly mechanisms. In addition, Lowe suggests that the EU should take on more of the financial and administrative burden to reduce costs to smaller firms, especially in lower-income countries (p. 5). Lowe could envision this cost to the EU being recouped from the CBAM revenue, resulting in no additional cost to the EU while reducing costs for smaller firms reducing a possible trade barrier.

Gain International Support and Expand Carbon Border Tax Programs Worldwide

The EU must gain international support before this program is put into place. There is a fear of retaliation from other countries due to the perception that this border tax is protectionist. The EU should take time to work with its trading partners and at least garner support for its proposal. If the EU can persuade other countries that this proposal is necessary and important, there could be additional domestic climate policies worldwide that would complement the carbon pricing in the EU. The best-case scenario would be a country such as the US putting into place a carbon border tax (if not the same one). This would result in further emissions reduction and create another global collaboration that takes a stance against climate change.

Reduce Disproportionate Effect on Developing Countries

The biggest obstacle for the EU to overcome is the effect on developing countries. Michalek (2021) suggests that a carbon border adjustment could boost low carbon investments abroad. Clean technology investment can result in increased efficiency and productivity, something that Michalek (2021) argues would be extremely beneficial and profitable to developing countries. The EU could help this process by encouraging foreign direct investment (FDI) in those developing countries that will have to make the most changes to their production lines and invest clean technology abroad. The EU could make clean technology more accessible in these countries and help progress towards cleaner technology (Ianchovichina and Onder, 2021). This is something the EU has noted it is willing to do and says, “the EU also stands ready to work with low-and middle-income countries towards the decarbonization of their manufacturing industries. The Union will also support less developed countries with the necessary technical assistance” (European Commission). Ianchovichina and Onder note that targeted technology transfer programs can be put in place to help this process.

There are also many suggestions by economists and researchers for the EU to reduce other trade barriers for products produced with fewer emissions to complement the policy and increase the incentive to change to greener technology (Ianchovichina and Onder).

Lowe argues that other steps can be taken to reduce tariffs and trade barriers for developing countries, namely the EU’s aggregate ‘most favoured nation’ tariff that applies to countries where trade agreements are not in place (p. 6). The EU needs to follow through on its promise to aid low- and middle-income countries to ensure their economies are not negatively affected and achieve the transition to greener technology.

Conclusion

Although the CBAM is an ambitious and first-of-its-kind policy, there is evidence that an international carbon border tax will successfully reduce emissions and reduce carbon leakage. At this point, it is difficult to determine the exact effects this policy would have due to the continuation of COVID-19's effects on the supply chain and worldwide economy. However, it is imperative that as the EU moves forward with its proposal, it gains international support and works to support developing countries' economies in order to prevent supply shock, trade wars, and rising consumer costs. If done properly, the CBAM can demonstrate the EU is a global leader in climate policy and increase the use of carbon pricing throughout the globe. It is time that carbon is considered in all production to reduce the effects of climate change. The EU's CBAM proposal could accomplish these goals and be an effective economic policy to reduce emissions and contribute to the world's efforts to lessen the effects of climate change.

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