

Research on the Relationship Between International Trade and Environment

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ABSTRACT

Nowadays the impact on the environment brought by international trade has drawn wide public concern. It boosts the economy of the related countries while bringing detrimental effects to the environment. Focusing on the negative side, diverse respects including air pollution, climate change, and biological diversity are discussed in this article. During the process of manufacture and transportation in trade, a large number of harmful gases such as SO₂, NO_x will be emitted into the air, resulting in increasing sulfuric acid rain. The surge of carbon dioxide brought by economic activities strongly influences the average temperature worldwide, while this exhaust also accelerates the formation of PM_{2.5}, thereby threatening the respiratory system of people. When people realize there are huge profits brought by natural resources: marine, forest, and body parts of rare species, (shark fin and ivory, for example) various illegal activities such as overfishing, deforestation, as well as killing endangered wildlife will rise dramatically. These phenomenon can bring serious damage to the biological diversity and ecosystem. To address the problems mentioned, several plausible solutions are proposed. Through the implementation of policy protection at the supervision level, trade agreements, and high punitive tariff barriers can ease the situation. Based on empirical analysis and primitive inference, it is concluded that irrational international trade is well worth governments' attention. They need to find a balance point between being too conservative and simply caring about earnings.

Keywords: *International trade, pollution, emission, economy, overfishing, carbon dioxide, greenhouse gases, SO₂, NO_x*

1. INTRODUCTION

In 2001, the result of the carbon dioxide emitted during international trade among 87 countries suggests that over 5.3G tons of the gas were spread, and it can be influenced by country characteristics. It is accepted that emissions in trade are strongly correlated with the value of diverse global climate policies. Several improvements of global climate policies to reduce the impact of international trade are discussed [1]. It analyzes the impact of economic growth and international trade on the level of air pollution. An estimated structural equation model is applied in the research. The result suggests that both international trade and per capita income can contribute to changes in economic activities, thereby increasing air pollutants. The result also shows that the impact of economic growth in air pollution varies between developing and developed countries [2]. It analyzes the impacts of trade-related Chinese air pollutants on the global atmospheric environment in 2006. During the time, about one-fifth of export-related

Chinese emissions can be attributed to China-to-US export. Atmospheric modeling shows that pollution leads to rising sulfate concentrations and ozone over the western United States. Additionally, the decrease of sulfate pollution in the eastern United States indicates the competing effect between enhanced transport of Chinese pollution and reduced US emissions [3].

Nowadays, a significant number of species are threatened as a result of international trade along complex routes. To be more specific, consumers in developed countries cause threats to diverse species through manufacturing commodities in developing countries. The research shows that 30% of global species threats are due to international trade. This result emphasizes examining biodiversity loss as a global systematic phenomenon, to facilitate better regulation, sustainable supply-chain certification, and consumer product labeling [4]. The report considers whether globalization has damaged environmental goals. economic growth can be positive also can be negative. In

the basic trade case without externalities, we can unequivocally say that trade brings overall benefits decided by the size or the nature of its damage if policies were clear we can make sure how much we earned [5]. Opponents of globalization claim that international trade harms the environment. They found that for a given income level, the impact of trade on at least three types of air pollution seems to be beneficial rather than harmful. Openness as measured by the ratio of trade to income seems to reduce air pollution. The statistical significance level of sulfur dioxide (SO₂) is high, while the statistical significance level of particulate matter and nitrogen oxides (NO_x) is moderate. As a result, economic growth won't bring damage and it helps the environmental problem [6].

The environmental problem became more and more serious. Some theories supporting international trade, such as economic theory, complicate the debate because supporters of the economic theory believe that international trade is crucial to the economy. After all, it can bring strong economic growth and greater welfare to citizens. In other words, environmental policies and objectives are difficult to achieve in these debates [7]. First, international trade hurts the environment. First, externality. Due to the existence of externalities, international trade will encourage environmental damage. Second, the transformation of polluting industries and hazardous wastes are to developing countries and the over development of resource-intensive products in developing countries. Third, international trade indirectly leads to resource plunder. Trade increases economic activities and is bound to consume more resources and energy [8]. The international discussion on environment and trade began in the early 1970s, and then the attention of all parties to environment and trade gradually increased, and the integration of environmental policy and trade policy changed from weak to strong. Its development can be divided into three stages: the first stage, the cognition period (the 1970s to 1980s) The second stage, the practice period (from the early 1990s to the early 21st century) In the third stage, the deepening period (after the 21st century), the integration of environmental policy and trade policy has been greatly strengthened [9].

Through the form of transportation, international trade and economy have a serious impact on environmental resources, that is, flow pollution. On the other hand, when dealing with pollution, it will lead to the birth of new environmental pollution, so it is a very bad cycle. There are packaging pollution, material pollution, and garbage pollution. A series of pollution classifications are due to the emergence of international trade. Under the export-oriented economic model, international trade has a long-term impact on the environment. For example, under the condition of an open economy, industrial wastewater participates in international trade and international capital flow. The

basic condition for realizing the EKC hypothesis is that domestic environmental policies must be continuously strict with economic growth. Only in this way can the "inverted U-shaped" relationship between pollution and income remain unchanged, and the shape and position of the curve will change, which depends on the level of economic development [10].

2. IMPACT OF ECONOMIC ACTIVITIES ON THE ENVIRONMENT

2.1 Air pollution

It is widely accepted that modern productivity is advancing at an amazing rate, which enhances economic activities, especially international trade. However, this may bring a series of trouble associated with the environment. The deterioration of the air quality is concerned to be one of the severe problems, for the reason that during international trade, diverse harmful gases can be emitted through goods production and transportation. To be more specific, a complete chain of car transactions includes the following four main steps: manufacturing various spare parts of vehicles in a factory in one region; selling them abroad through air freight or shipping; assembling the iron pieces; delivering finished products to the customer.

At present, due to the casual production and transportation of many small and medium-sized enterprises without enough supervision, each step mentioned can increase the air pollutants sharply in different ways. Besides, it is reported that some foreign companies transfer hazardous wastes produced in international trade such as PM_{2.5} to developing countries may also give rise to a surge in the air contaminants. As a result, international trade is contributing to the globalization of air pollution. Research shows that there are millions of people die every year from diseases caused by exposure to outdoor air pollution brought by international trade, which worth people's attention all over the world [11].

On the contrary, one possibility of international trade to reduce air pollution is that it increases the source of funds for air purification technology indirectly, which seems to be a feasible way to alleviate air contamination.

2.2 Climate change

Gasoline accounts for 95% of energy consumption and is a very important factor in its greenhouse gas emissions. Economists have created a conceptual framework to explore the three important effects of trade on the environment and the scale effect, structure effect, and technology effect, which are used to analyze the impact on climate change under different economic activities. Through a combination of scale effect and structure effect, environmental factors are added to a

theoretical model, and it is found that the research is biased towards technology effect, More significant. International trade will continue to transport greenhouse gas emissions, which has a great impact on it. Gasoline accounts for 95% of energy consumption in transportation, which is a very important factor in greenhouse gas emissions. There are many different transportation methods, such as road transportation and air transportation. Nearly 74% of greenhouse gas emissions from sea transportation are generated by road transportation, and the other 12% are generated by air transportation. FDI has a very negative impact on climate change because the limit of people's living indicators has decreased, and with the transfer of technology, it is more and more necessary to adapt to climate change. China is now a big trading country and a big carbon emitter. It can not only promote economic development but also play a role in climate protection.

2.3 Biological diversity

The term biological diversity or biodiversity refers to the number, variety, and variability of all living organisms in terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part. The relation of it with economics is that because of the overcutting and overfishing, there will be a lot of restrictions nowadays, for example, Biodiversity is ubiquitous in the economic system and is affected by land and water use decisions, pollution, and economic activities. Because they are market-based, incentives can "filter" the entire economy and make it an open-minded self-interest of owners and those who use resources to use their knowledge and skills to protect their jobs. For example, the premise of the basic ecological labeling system of wood products is that the wood trade can strongly encourage producers to engage in sustainable forest management. Similarly, restricting development rights to one region and making these rights tradable sends a price signal, which indirectly affects the whole economic system by directly affecting real estate value and economic development. To find the root causes of biodiversity loss, it is necessary to ask why land conversion and other proximate causes of biodiversity loss occur. Expressed in this way, it can usually be seen that there are many main driving forces, including population distribution and growth patterns, consumption and production patterns, and economic failure. Conversely, economic failure includes market failure; Inadequate or unclear definition of property rights; Uncertainty and information failure; Intervention or system failure; Failure of government integration; And international trade.

3. MAIN PROBLEMS

3.1 Sulfuric acid rain and PM2.5

As mentioned above, international trade can function as a double-edged sword. It boosts the economy of the whole while bringing pollutants into the air. Since the 1980s, global environmental pollution has become more serious than regional pollutants produced by local companies, which suggests that international trade does have an important role to play in polluting the air in this day and age. To exemplify it, research using empirical data indicates that there was a rapid growth in international trade in the United States from 1997 to 2004, and at the same time, it was the world's largest emitter of greenhouse gases, SO₂, NO_x, as well as other air pollutants [12]. The figure shows that in 1997, the embodied emissions of SO₂ and NO_x in international trade began at 4.0Mt and 2.2Mt respectively. Both of the numbers doubled in the following 8 years. This could explain the rising frequency of acid rain in some certain areas of the United States since SO₂ and NO_x are regarded as the culprit to form acid rain according to scientific research. More importantly, the issue of carbon leakage during international trade is also worth serious consideration, for the reason that carbon dioxide can be transferred into organic carbon under some proper circumstances, and organic carbon is one of the major components of PM_{2.5}. There is plenty of scientific and medical evidence showing a direct link between human respiratory diseases and the rise of PM_{2.5}. For instance, PM_{2.5} can penetrate deeply into the lung, irritate and corrode the alveolar wall, consequently impair lung function, and eventually destroy the respiratory system [13].

3.2 Overfishing and logging

The main reason for overfishing is the uncertainty of property rights. In the past, when studying biology, the fishery stock that kept the fastest growth of fish stocks was $x/2$, but the premise for fishermen not to overfish was clear property rights. The problem of property rights can explain many phenomena. overfishing exists, but once the number decreases, the cost of fishing becomes higher and higher, and fishing will stop. The reduction of fish supply will increase the price of fish, but the cost of using fish is higher and higher, so the demand for fish will decrease. Also, overuse of wood will make a product that is made by a wood increase to a higher price which means other products might replace wood, and woods prices are very high so people would choose other materials to replace wood products. For example in China because of overusing woods now a lot of places were not allowed Felling which means woods will be charged at a higher price and people will start to use other materials to replace them. In conclusion overuse or

overhunting will bring huge damage to the economy because people will choose other products to replace it.

3.3 Climate warming and extreme weather

The greenhouse effect mostly refers to man-made factors such as water, gas, carbon dioxide, methane, and so on. The impact on climate is very complex. Generally, there are many ways to change, but in the human regulation of temperature, with the development of industry, most of the fuels are constantly burning, resulting in a significant increase in carbon emissions. According to calculations, the content of carbon dioxide in the atmosphere increased by 10% from 1860 to the millennium. With the development of industry, many factories will pour their garbage or oil into the sea, resulting in marine pollution and weakening the regulation of the marine ecosystem on the temperature. But in fact, global warming has both advantages and disadvantages. In most areas, global warming will affect people's lives, and many crops are difficult to produce. However, in the Sahara desert, it will promote their agricultural production, so it brings economic benefits, but it also has a bad impact, mainly depending on how people make use of the impact of these greenhouse effects.

4. SOLUTION

The increasing degree of trade liberalization indeed plays a negative role in environmental pollution. To improve this situation, some targeted measures came into being.

4.1 Policy protection

At the macro level, it is important to recognize the existence of the problem and then collect data over time to track progress. We can also use these data to make strategic decisions to help protect areas at high risk of overfishing. In the United States, the National Oceanic and Atmospheric Administration tracks fish population data and then helps inform different regulations. By closing aquaculture areas or establishing marine protected areas, laws and regulations can protect and replenish fish resources. Regulations could also be enacted to limit the length of the fishing season or to limit certain fishing methods, such as bottom trawling. Bottom trawling involves dragging a heavy net on the seabed. It is a very nonselective fishing method. It is estimated that 90% of trawling is incidental damage, which means that it is accidental fishing. Mistakenly caught fish must be thrown overboard, but they are often killed in the process.

By regulating these practices, governments can help support future sustainable fish stocks and help rebuild at-risk fish stocks. However, this requires the participation of governments around the world to help reduce overfishing through policies.

4.2 Trade agreements

One way is that many countries have achieved the purpose of emission reduction by making unilateral or multilateral trade agreements, to protect human, animal, or plants life or health and preserve the natural environment. A typical example is the overall quality management standard system ISO9000 launched by the international organization for Standardization in March 1987, and the subsequent ISO14000. They are a series of environmental management criteria formulated to protect the global environment and the sustainable development of the world economy. Two standards are the analysis and inspection of product material composition and energy control. To be more specific, through the restriction of product raw materials and packaging harmful substances such as lead, cadmium, mercury, and sulfide, as well as ensuring the cleanness of production energy, the emission reduction of harmful gases such as NO_x and SO₂ can be reduced in the stages of product research, development, production, sales, and use, eventually realizing green trade. Since Germany first implemented the "Blue Angel" environmental standard system in 1977, more than 40 countries have implemented similar strategies.

4.3 Tariffs

Another way to decrease the emission of harmful gases from trade activities to the environment is the imposition of tariffs. To obtain high profits, some manufacturers still export industrial finished products or high-tech products to countries lacking relevant production factors on the premise of violating environmental standards. To combat this problem, the governments of product importing and exporting countries greatly cut down the profits of manufacturers by high punitive tariff barriers, dispel their idea of mass production, and finally achieve green production, energy conservation, and emission reduction.

5. CONCLUSION

With the acceleration of industrialization and the continuous deterioration of the human living environment, people begin to pay more and more attention to the problems related to the ecological environment, which has set off a wave of sustainable development to protect resources and the ecological environment all over the world. International trade is an important driving factor of modern economic growth. As a cross-border and global economic behavior, it bears the brunt of the protection of the whole earth's environment. To protect the ecological environment, many countries have formulated a series of environmental protection measures. The formulation of environmental standards can optimize the commodity structure of national trade on the one hand, and will lead to a widening gap between

the north and the south on other hand, at present, trade protectionism prevails, and environmental protection has become a means of trade protection. Therefore, in the era of the "green economy", the relationship between environment and trade has also become a new hot spot.

Now, with the awakening of environmental protection consciousness, the rise of environmental protection movement all over the world, and people's failure to protect the environment in the process of life and production in the past few hundred years, it has brought serious harm to the ecology of our earth, so that there is a state of unsustainable production and life in many countries. Therefore, the environmental protection movement is rising all over the world, formulating environmental laws and international conventions on the environment, and even some environmental provisions are set in the conventions specifically encouraging trade in the WTO.

This paper analyzes some existing problems and puts forward corresponding solutions, which can help the global environmental development. It is hoped that the earth can better protect biodiversity and provide a better living environment for mankind while trade develops.

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