Chapter 12
Emission Permit Trading:
A Theoretical Analysis

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ABSTRACT

After the Kyoto Protocol, the new concept of carbon trading emerged. The carbon emission can be controlled by cap and tax system. Cap and trade is the permit that determines the maximum amounts of carbon emission. Carbon tax is imposed on amount of carbon emission. Other instruments of carbon emission are border adjustment and cash payment. Carbon permit is determined by market mechanism through demand and supply. Generally, there are two types of markets: regulated and voluntary. The chapter analyzes mechanisms and discusses the mitigating policies like Kyoto Protocol and tries to examine all aspects related to carbon leakage. The developed countries import carbon-intensive goods. Underdeveloped countries produce and export carbon-intensive goods. In this study, the authors show the prospect of carbon trading and various effects of carbon emission reduction policies on a theoretical framework.

INTRODUCTION

Recent years the Global Climate Change is the biggest problem in the world. The Global sea level has risen by amount of 20 cm. It is partly due to melting of mountain ice and partly due to thermal expansion of the oceans. Therefore, the human civilization faces a great crisis.

The Green House Gas (GHG) performs actively for the global warming and climate change. Carbon dioxide (CO2), Chlorofluorocarbon (CFC), and methane (CH4) etc. are the Green House Gases (GHGs). Carbon dioxide is the main culprit of global warming and/or climate change. So, society creates laws and imposes regulation on carbon emission or carbon generating activities. There are many mitigating process to reduce the GHG emission. The effective mitigating process is Cap-system. Every country fixed up a cap of Carbon emission. Cap is a limit of Carbon emission. Countries never cross this limit

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or cap. Generally, the developing countries have lower level of carbon emission than their approved cap which is set by regulatory authority, while the developed countries generate more carbon emission than their assigned cap. Cap is the constraint of economic activities for most of the countries. Following cap-system new line of trade emerges which is termed as *cap and trade.* In this context, the Multinational Companies (MNCs) gets a huge environmental discount from the developing country. So, the Multinational Companies (MNCs) produces commodity in developing countries and trade with the rest of the world. The developed countries take a protection from the environmental degradation through the cap system. The developed country traded environmental protection instead of economic activities. In this way carbon trade is occurs in the world. So, *cap and trade* is one part of *carbon trade*. Addressing the challenge of climate change has brought about policies and proposals that radically alter emissions from industry, especially from the electricity system. The added costs of climate policies have impacts on different parts of the electricity supply system, ranging from generation to transmission. The magnitude of these added costs resulting from climate policies such as *carbon taxes, cap-and-trade* schemes and mandatory renewable energy targets varies across countries, partly according to the commercial and regulatory structure of their coal based electricity systems(since major emission of carbon-di-oxide occurs from power sector,) and it is difficult to separate the effects of such climate policies from other electricity price drivers such as domestic regulatory regimes, competition, electricity import and export options and historic investments in alternative electricity generation sources. Therefore, in the policy making context, the assessment of carbon leakage risks has recently been embedded in a comparison of electricity prices faced by industry in their country as compared to main trade competitors.

Climate change regulations might only cause firms to relocate their activity to another country with less stringent regulations, whilst reducing economic activity in the initial host country. This is the source of *carbon leakage* (Fischer and Fox 2012). The carbon leakage occurs when there is an increase in carbon-dioxide (CO_2) emission in one country as a result of an emission reduction by a second country with a strict climate policy (Barker,.et.al, 2007). In other words, carbon leakage can be defined as the ratio of emission increasing from a specific sector outside the country over the emission reduction in the sector. *Zmijewski (2011) defines the carbon leakage on the other way. Carbon leakage denotes the allocation of energy intensive and high carbon emitting manufacturing industries from countries with Green House Gas (GHG) emission reduction policies to country without climate regulation in place.*

Most of the literature on carbon leakage is ex-ante and measure the size of positive leakage based on computable general equilibrium models (Burniaux & Martins, 2012; Babiker, 2005; Aichele &Felbermayr, 2013). The estimated leakage depends on the policy scenarios and it varies 2% to 20% (Burniaux &Martins, 2012), one extreme scenario is 130% (Babiker, 2005). Kyoto commitment reduces domestic carbon emissions but not the carbon footprints. Aichele and Felbermayr (2013) find carbon leakage in the gap between domestic consumption and production.

Energy efficiency standards more consistently and significantly caused negative impact on industrial competitiveness than carbon taxes (The World Bank, 2008); in the US, higher electricity price reduced employment both in energy-intensive industries in a county (Kahn and Mansur, 2013) and collectively for a state.

Carbon regulation has intension to reduce global emissions, but there is growing concern that such regulation may simply shift production to unregulated regions and increase global emissions in the process. *Carbon tariffs* have emerged as a possible mechanism to address these concerns by imposing carbon costs on imports at the regulated border. Darke (2012) shows that *carbon leakage* can result despite the implementation of a carbon tariffs when firms choose from discrete production technologies