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AN INTER-TEMPORAL PRODUCTION STRATEGY UNDER A CARBON TRADING POLICY

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Abstract

In recent years, increasing temperatures and extreme weather conditions have had a significant impact on quality of life, especially in terms of the environment. Governments have made environmental preservation a priority and have received public support in turn. We formulate models to investigate a company's optimal production quantities over two periods, including green technology efforts, to examine the impact of a carbon trading policy.

We build separate inter-temporal production models under carbon cap and carbon trading policies based on news vendor theory. Then, we utilize optimization theory to obtain the optimal production quantities over two periods also considering the manufacturer's green technology efforts. From our analysis we draw some important managerial insights. Manufacturer's carbon emissions can be reduced when carbon cap and carbon trading policy are implemented. But, carbon trading is amore incentive scheme that encourages manufacturers to reduce pollution. In addition, the adoption of green practices actually carries many important benefits, both in environment and finance.

Some restrictions and limitations are created by the assumptions, such as only monopoly manufacturers are considered and the price of carbon emissions is constant in each period.

Although the importance of the inter-temporal issue is recognized by many existing models, its implications for carbon trading policy have not been widely studied, and we allow for combinations of both. The findings in this paper can play an important role in environment preservation.

Keywords: carbon trading, green technologies, inter-temporal, production strategy

Received: February, 2016; *Revised final:* May, 2017; *Accepted:* June, 2017

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