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How does carbon pricing policy influence carbon emission intensity? New evidence from Canadian Provinces

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Summary

Mitigating climate change remains a concern for the global ecosystem, which calls for addressing the fundamental causes of climate change like greenhouse gas (GHG) emissions (De Miguel et al., 2015, Duan et al., 2019). Canada responded to this climate call by introducing a Pan-Canadian Framework on Clean Growth and Climate Change in 2016. This framework is designed to achieve an emission reduction of 30% by 2030 compared to its 2005 levels and attain net zero emissions by 2050 (Statistics Canada, 2017). Furthermore, the federal government increased the 2030 target to 40% in 2021. Then, it implemented a federal carbon tax in 2022 on provinces without any carbon pricing policies(GOC, 2021). The carbon pricing policies in Canadian Provinces exhibit significant variations in their implementations. For instance, some Provinces such as Ontario, Manitoba, and Yukon implement a fuel charge system while others (e.g. Prince Edward Island) utilise an output-based system to meet their specific local needs.

On the other hand, the welfare impact of this carbon pricing policy ignites the ongoing debate in academic and stakeholder communities (Parry, 2021) due to the potential adverse effects on economic growth and employment. Therefore, our study examines the effectiveness of carbon pricing policy in reducing province-level carbon emissions. The findings reveal a significant role of the policy in reducing carbon emission inefficiency. In addition, robust economic growth reduces carbon emissions intensified by an increased use of capital equipment and more consumption of energy, especially fossil fuels. Thus, it is a worthy recommendation for Canadian policymakers to align the use of advanced equipment with carbon emission reduction targets. Moreover, the rapid deployment of renewable technology to replace fossil-induced emission intensity would enhance the role of carbon policy and economic growth in improving carbon emission efficiency.

Keywords: carbon pricing policy; carbon emission intensity; stochastic frontier analysis; Canadian provinces

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