

Promoting Supplier's Environmental Innovation via Emission Taxation

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Abstract

With growing concerns on pollutant emissions from manufacturing processes, emission taxation is becoming increasingly popular by many governments, aiming to incentivize firms' emission reduction efforts. In some industries, however, the amount of pollutant emissions largely depends on the quality of the raw materials provided by suppliers, in which case motivating the suppliers' environmental innovation efforts could be crucial for an effective regulatory control of pollutant emissions. Nevertheless, many governments adopt the "polluter pays" principle and impose the emission taxes on the manufacturers. Hence, a key question for the regulator in this context is whether such a tax burden on the manufacturers can effectively incentivize the suppliers' environmental innovation through the supply chain contracts chosen by the profit maximizing manufacturers. Thus motivated, this paper studies the impact of supply chain contracts in the presence of emission taxation on supplier's environmental innovation by analyzing a monopoly model where the manufacturer sources raw material from a single supplier. We consider three contracts commonly observed in practice in this type of settings: i) wholesale price contract; ii) quality requirement contract; and iii) cost sharing contract. We find that the impact of each contract is quite different and show why increasing tax pressure may not necessarily enhance the supplier's innovation effort. More importantly, our result shows that a very mild tax intensity can be most effective in maximizing the supplier's environmental innovation investment. This result alleviates the widely agreed concern that emission taxation may negatively impact the end product market and hurt welfare. In addition, we show that it does not matter to whom the environmental tax is charged, and accordingly, double counting of emissions, i.e., charging the emission tax on the supplier as well, may *discourage* the supplier's environmental innovation for all contracts we consider. Our results highlight the importance of understanding the impacts of the supply chain contracts for the regulator to effectively motivate firm's environmental innovation via emission taxation without severely choking the business.

Keywords

Sustainability, pollution regulation, emission taxation, environmental innovation, supply chain contract.

Biographies

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