

REGIONAL COORDINATION OF EUROPEAN ENVIRONMENTAL POLICIES

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Overview

We study the nonparticipation costs that arise when some European Union (EU) countries do not take part in the agreement to reduce polluting emissions; the relating opportunistic behavior is quite recurring in global public goods issues as global warming. It is widely accepted that EU countries should take complementary and coordinated actions to green themselves, by implementing their own national plan (Böhringer et al., 2009). We investigate the excessive costs EU as a whole suffers for achieving the objectives of the 20/20/20 climate and energy package from the limited participation, or non-participation of some European countries to the agreement to reduce polluting emissions, through opportunistic behavior. Most of the literature on opportunistic behavior of environmental coalitions (Carraro et al., 2006; Nordhaus, 2009; Rathmann, 2007) argues that it is luckily to reach a non cooperative outcome when countries first decide if or not to cooperate, and then set their environmental policy: the equilibrium of such a game is that a subset of countries cooperate and the remaining ones find more profitable to free-ride. This is the case of the policy coordination problem described by the chicken game (Carraro and Siniscalco, 1993). We divide the EU in two groups, the old and the new member States (EU 15 and EU 12); such division reflects both the contribution to CO₂ emissions and the economic trend that is very low for EU12 countries compared to the old member States. We estimate the impact of partial participation and we show that limiting participation produce inefficiencies by rising the costs for the participating countries to the agreement.

Methods

First, we review the literature on economic instruments for environmental regulation and we focus on the choice between prices and quantities to achieve a particular target (Hepburn et al., 2006). We review the Weitzman theory (1974) in order to show the relative merits of quantity based and price based mechanisms; we provide further consideration about the EU policy debate (Böhringer et al., 2009). Every country would want to spur new activities, new investment, more employment in its own territory, by using an appropriate mix of taxation and subsidies, in conjunction with other command and control instruments. However, EU countries have the incentive to free-ride, or to impose as few costs as possible on their home economy while enjoying the benefits created at the other countries' cost (Barrett, 1994). In order to estimate the general impact of partial participation, we use the standard approach to modeling participation cost function that is the Dynamic Integrated Climate Change (DICE) model implemented by Nordhaus (2006). We divide the EU in two groups, the old and the new member States (EU 15 and EU 12). Such division reflects both the contribution to CO₂ emissions and the economic trend that is very low for EU12 countries compared to the old member States. Through the DICE model, we derive a mathematical representation of the result of incomplete participation. We quantify the inefficiencies deriving from limiting participation in terms of excessive costs borne by participating countries.

Results

Through the DICE model, we derive a mathematical representation of the result of incomplete participation. We quantify the inefficiencies deriving from limiting participation in terms of excessive costs borne by participating countries. For instance, limiting participation to the four big emitters that are Germany, United Kingdom, Italy and France would cover about half of EU emissions (precisely 53%). Through the cost penalty factor associated to this partial participation, we find out that achieving the 20-20-20 climate and energy package's goals would cost around four times as much (213%) if the Energy Package were limited to these member States. By including all the EU15 old member States would cover 82% of emissions and this would lead to a cost penalty of 25%.

Conclusions

The 20-20-20 climate and energy package requires simultaneous and coordinated actions. Both politically and institutionally the EU Member States (EU15) are quite heterogeneous, and the old member States have a bigger responsibility in attempting to de-couple economic growth and CO₂ emissions since EU15 are the big emitters. Unless cooperation is sustained by institutions which can punish free-riding, every region will earn even higher profits by free-riding on the virtuous behavior of the remaining co-operators. Our results reinforce the point that, to transform Europe into a highly energy-efficient, low carbon economy, achieving a high level of participation is a critical feature of an efficient policy.

References

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