Compliance with pollutant stock targets under environmental taxes and fiscal compensation

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Abstract

The paper develops a model of a stock-flow pollutant, such as atmospheric carbon or river basin salinity, and solves for the future time period (the compliance time) at which the actual pollutant stock should converge to some scientifically given sustainable value in order to maximize social welfare. A pre-existing "environmental" tax ensures shadow pricing of polluting inputs. It is shown that the transfers induced by the tax create a "double dividend" in terms of additional consumption and provision of public services, as found in the current literature. The contribution of the paper is to show that these fiscal transfers also "distort" the choice of compliance time in such a way that there is over-abatement, or under provision, of the pollutant stock (a public bad) during the transition to the sustainable stock value. The net result is that the fiscal transfers induced by environmental taxes are welfare-reducing in net terms. This leads to a further conclusion: that environmental taxes are distorting vis-a-vis regulatory standards in stock flow problems. Finally, countries with a pre-existing reliance on environmental taxes to ensure optimal input usage are shown to choose more aggressive (sub-optimal) abatement relative to countries that rely on regulation to control pollution.

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