



Allocation of emission permits with leakage through capital markets

Ottar Mæstad*

Chr Michelsen Institute, P.O. Box 6033 Postterminalen, N-5892 Bergen, Norway

Received 30 June 2005; received in revised form 10 February 2006; accepted 5 April 2006

Available online 13 July 2006

Abstract

This paper analyses how tradable emission permits should be allocated to firms when capital is internationally mobile. When international environmental problems are attempted solved through uncoordinated policies between countries, it might be desirable for the home country to issue free emission permits in proportion to the use of capital in order to prevent leakage through international capital movements. The desirability of free emission permits will however be reduced if capital also can be employed in a domestic non-polluting sector. In this case, it may even be optimal to tax the use of capital in the polluting sector. It is also shown that it is always optimal to subsidise the use of capital in the polluting sector if the use of labour is taxed at an optimal rate. Finally, leakage does not affect the optimal domestic emission limit as long as appropriate capital subsidies and labour taxes are implemented.

© 2006 Published by Elsevier B.V.

JEL Classification: D62; F21; Q28

Keywords: Emission permits; Capital mobility; Environmental policy

1. Introduction

Tradable emission permits seem to be gaining political acceptance as a useful policy instrument in environmental policy making. A few tradable emission schemes have been in place for years (e.g., the SO₂ trading scheme in the US), and a number of countries have decided to use tradable emission permits as the leading policy instrument for meeting their obligations under the Kyoto Protocol (e.g., the EU countries).

* Tel.: +47 55 57 40 00; fax: +47 55 57 41 66.

E-mail address: ottar.mestad@cmi.no.

The use of tradable emission permits in environmental policy raises some important and difficult questions. One question is whether the government should auction the emission permits or distribute the permits free of charge. There are several reasons why this is not merely a question about income distribution. First, to give free emission permits may imply a loss of government revenue. This leads to efficiency costs if public expenditure is financed by distortionary taxes (e.g., [Goulder et al., 1997](#); [Parry and Williams, 1999](#); [Goulder et al., 1999](#)).¹ Secondly, free emission permits may in itself affect the resource allocation. The exact effect will depend on the allocation criteria used. Some allocation rules will not affect the real economy at all, such as “grandfathering” based on historical emissions. But other conceivable allocation rules will surely have real effects, for instance when free emission permits are distributed on the basis of the actual level of production or the amount of capital or labour used. As we shall see below, some of these real effects may be desirable while others are not. The question is therefore how free emission permits should be allocated in the most efficient way.

The fact that free emission permits may have real effects is particularly interesting in the case when tradable emission permits are used to solve an international environmental problem, such as the climate problem. The fundamental problem when trying to come to grips with the climate problem is that individual countries have incentives to act as free riders. Therefore, coordinated policies, including all affected parties, may be difficult to achieve. However, it may still be possible for a limited number of countries to form a stable cooperating coalition in the sense that it is not in the self-interest of any country to break out of the coalition and resort to non-cooperative behaviour (e.g., [Barrett, 1994](#); [Hoel, 1992](#)).

One obvious problem faced by such a cooperating coalition is that policies that reduce pollution within the cooperating countries may cause increased pollution from non-cooperating countries. This is known as the leakage problem. Leakage may occur through several different channels, both through product markets and factor markets. In this paper, we shall focus exclusively on leakage created by international capital movements. If environmental regulations in the cooperating countries reduce the rate of return to capital, and capital is internationally mobile, we may observe capital flight towards the non-cooperating countries. If more capital in the foreign country increases the marginal productivity of polluting inputs, foreign pollution will increase and thus offset emission reductions at home.

Certainly, the home country may take action in order to reduce the leakage through capital markets. One obvious candidate would be to put restrictions on capital movements ([Hoel, 1996](#)). Such policies are however difficult to implement in practice, since we are usually not talking about restrictions on capital movements in general, but restrictions on capital movements to particular foreign sectors. Such sector specific restrictions on capital movements would be quite easy to evade.

If capital exports cannot be taxed or otherwise restricted, an alternative policy would be to subsidise the use of capital at home. This possibility has been discussed by [Rauscher \(1997\)](#) and [Mæstad \(2001, 2006\)](#), who find that in order to reduce the leakage through the capital market, the home country should combine emission taxes at home with subsidies to capital. [Mæstad \(2001, 2006\)](#) shows that when a system of tradable emission permits rather than emission taxes is used,

¹ See however [Mæstad \(2006\)](#) who shows that to allocate *some* emission permits free of charge does not necessarily reduce public income. If free emissions permits are allocated to firms based on their capital use, free permits may attract capital from abroad. This may drive up the price of permits to such an extent that it more than offsets the initial revenue loss from allocating some permits free of charge.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات