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European Emission Trading Scheme and competitiveness: A case study on the iron and steel industry☆

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Abstract

We quantify the impact of the European Emission Trading Scheme (ETS) on the two dimensions of competitiveness – production and profitability – for the iron and steel industry. Among those covered by the scheme, this sector is one of the most exposed, since it is both highly CO_2-intensive and relatively open to international trade. We also examine the robustness of these results to various assumptions: marginal abatement cost curve, trade and demand elasticities, as well as pass-through rates and updating of allocation rules, of which the latter two are scarcely debated.

We conclude that for this sector, competitiveness losses are small. We prove this conclusion to be robust. Hence arguments against tightening the environmental stringency of the ETS in Phase II are not justified on grounds of competitiveness loss. Our systematic sensitivity analysis allows us to identify the important assumptions for each output variable. It turns out that pass-through rates and updating rules are significant, despite being often implicit and least debated in existing analyses.

Keywords: Iron and steel; Competitiveness; Emission trading; Greenhouse gas mitigation; Pass-through; Updating of allocation

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1. Introduction

The European GHG Emissions Trading Scheme (ETS) is the largest cap-and-trade system worldwide and the most important European climate change mitigation policy in place. Its environmental effectiveness depends on the stringency of the overall emissions cap. However, with decentralised allocation – "national allocation plans" (NAPs) submitted by each member states and reviewed by the European Commission determine national caps which aggregate to make the EU cap – the environmental stringency is indirectly controlled.

In phase I of the directive (2005–2007), the number of allowances allocated was close to, or higher than the likely business-as-usual emissions during this period (Reilly and Paltsev, 2005; Schleich and Betz, 2005). This lack of stringency is largely fuelled by concerns about the competitive disadvantage for European economies vis-à-vis non carbon-constrained countries such as the U.S. and developing countries.

The debate on industrial competitiveness is blurred, however, by loosely defined wording such as "competitive disadvantage", "competitive distortion" and "competitiveness" which can be interpreted very differently. For example, on a macroeconomic level, the very notion of competitiveness can be argued to be meaningless because exchange rates adjust over time to make up for "competitiveness distortions" experienced by a nation (Krugman, 1994). Yet on a micro level, individual industrial sectors and companies will lose or gain "competitiveness" — this can basically be reduced to two interpretations:

1. a loss in domestic production, which in turn may induce industrial relocations, domestic employment losses and possibly leakage to pollution havens;
2. a loss in profits, hence in stock value, of domestic firms.

It is essential to disentangle these two effects since, as we shall see, the ETS may impact them in very different ways.

The iron and steel industry sector is one of the most exposed among those covered by the EU ETS, since it is both highly CO_2-intensive and relatively open to international trade (Quirion and Hourcade, 2004). Studies that have assessed the impact of the EU ETS in this sector (cf. Oberndorfer, 2006, and references therein) generally conclude to a modest decrease in EU production. Conversely most of these studies do not address the second aspect of competitiveness, i.e., profitability, one exception being Smale et al. (2006) who finds a positive impact.

However, these studies often do not report on the robustness of the results to the most obviously important parameters: marginal abatement cost, import, export and demand elasticities.

Debatable (and often implicit) modelling assumptions make it further problematic. First they generally do not make explicit, the rate of pass-through i.e. the share of an increase in marginal cost that is passed on to product prices. In addition, allowances are often assumed to be distributed on a lump-sum basis. As we will see, the latter assumption is not well-suited for modelling the EU ETS.

This paper assesses the impact of the EU ETS on both the production and profitability of the iron and steel sector by using a simple and transparent partial equilibrium model. Its simplicity allows us to vary key parameters and assumptions mentioned above and thus determine robustness and sensitivity of results to the different parameters. The parameters and assumptions that require more attention can therefore be identified.

We conclude that for the EU iron and steel sector in general, competitiveness losses, if any, are small. We prove this conclusion to be robust. Hence the tightening environmental stringency of