Executive Summary

Carbon leakage and competitiveness of cement and steel industries under the EU ETS: much ado about nothing

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Motivations

With international climate negotiations at a standstill, a world of fragmented regional climate policies is emerging and the perspective of a worldwide carbon price has been postponed. The main regional climate pricing experiment so far is the European Union Emissions Trading System (EU ETS), which is presented as the EU flagship climate policy.

Different carbon markets have been implemented since then but they remain modest in their ambition. Although there are different reasons for this worldwide lack of ambitious climate policies, among the main ones is the possible threat to the competitiveness of heavy industries and the resulting carbon leakage. Among ex ante studies, general equilibrium models point to a positive but limited leakage at the aggregate level. Moreover, the few existing ex post studies do not afford consistent conclusions.

The present paper aims at filling this gap by econometrically assessing the operational leakage over the first two phases of the EU ETS, in the two most emitting manufacturing industry sectors: cement and steel. They are both heavy industries affected by the EU ETS. However they rank differently along the two dimensions generally retained for assessing whether a sector is at risk of carbon leakage, i.e. carbon intensity and openness to international trade. Cement is very carbon-intensive but only moderately open to international trade while steel features lower carbon

intensity but higher trade openness.

Research Performed

The short term dynamics of typical cement and steel plant opens the possibility of operational leakage. Indeed, although fixed cost are important, they only represent a minority of total cost (around 10-20%), which allows many plants to be operated well below their nominal capacity. If carbon leakage occurs, it is through the trade of carbon intensive products. An indicator of carbon leakage is then a change in international trade flows (measured by net imports, i.e. imports minus exports). The general methodology is to econometrically estimate a relationship, obtained via an analytic model, between net imports and the carbon price, controlling for other factors that may influence net imports such as economic activity in and outside Europe (referred to as local and foreign demand).

The relationship between net imports and European or foreign demand that was predicted by the analytic model is confirmed by the empirical analysis. Indicators of local and foreign demand carry explanatory power for net imports, and the signs of their coefficients are conform to the theoretical model. An increase in local (respectively foreign) demand increases (respectively decreases) net imports. The fit is particularly good for the cement industry and a little less so for the steel industry.

Furthermore, our empirical model does not support the hypothesis that a high carbon price would induce an increase in net imports. For cement and steel, the coefficient of the carbon price has no explanatory power on net imports, even though the CO2 price has exceeded 20 euros for more than two years during the studied period.

Potential benefits and policy implications

Although based on a longer time series and more elaborate econometric techniques, this empirical work draws the same conclusion as the previous empirical literature on carbon leakage and the EU ETS, which is that the EU ETS has not induced operational carbon leakage.

Some may argue that, because these industries have benefitted from a large over-allocation of allowances during this period, the risk of operational carbon leakage was null.
Yet, as long as the allowances are allocated independently of current output, the operator of an installation may reduce emissions (by increasing the CO2 efficiency of its production process or by reducing the output level) in order to sell allowances even though he has received more allowances than its emissions. Hence, if one considers that companies behave as profit-maximisers, the over-allocation of allowances should not have an influence on operational leakage. The outcome of this study (no operational carbon leakage) is then far from trivial. It involves that in the price range that has been experienced for carbon (below 30 euros per ton), operational carbon leakage is not a serious threat for the energy-intensive industries.

This result applies in theory regardless of the allowances balance. In practice, no shortage of allowances is likely to occur until at least 2020: cement and steel companies have banked a significant surplus of allowances, and they will still benefit from over-allocation in phase III

unless demand goes back to pre-crisis levels. Thus auctioning a part of the allowances currently freely allocated to these sectors would not entail carbon leakage while it would bring public revenues, which would be welcome especially considering the public debt faced by many European countries.

However, the impact of the EU ETS on investment leakage, which corresponds to changes in production capacities as the result of the EU's climate policy, is still an open question. Indeed, since 2013 (the start of the EU ETS third phase), less allowances are allocated if current production falls through a threshold. Moreover, allowances are allocated for new production capacities and for capacity extensions. Thus free allowances might mitigate carbon leakage through an impact on the production capacity in Europe, rather than through operational decisions. This question could be investigated using foreign direct investment data as in the original pollution haven literature. Pending such investigation, we cannot conclude that free allocation should be scrapped, even though carbon leakage is presented as the main argument to maintain them.