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EU'S SUGGESTED CARBON BORDER ADJUSTMENT MECHANISM – INDUSTRIAL EFFECTS FOR A SMALL OPEN ECONOMY WITHIN THE COALITION

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Overview

Unilateral action to mitigate greenhouse gas (GHG) emissions leads to carbon leakage. The emission-intensive and trade-exposed industries (EITE) claim that emission constraints in the region would raise their production costs, and hence reduces their competitiveness in the world market. The industry may move their production or lose to competing producers in less regulated regions, and thus the policymaker achieves lower emission level locally but jeopardies job and industries to other regions. As a result, policymakers have either excluded the EITE industries from regulation or found other anti-leakage solutions. In the EU emission trading system (ETS), the EITE industries exposed to carbon leakage are given a large number of free allowances. The free allowances are allocated based on benchmarks such as production output, often referred to as output-based allocation (OBA) (Böhringer et al. 2017b). Most studies find that OBA would mitigate carbon leakage. However, it ends up stimulating too much production and consumption of the EITE goods. The reason is that OBA works as an implicit production subsidy, and consequently the incentives to substitute to less emission-intensive products are weakened. With uncertainty about leakage exposure for the sectors, policymakers may also overcompensate the sector with free allowances (see e.g., Martin et al., 2014).

The EU has recently decided on a carbon tariff at the border (CBAM – Carbon Border Adjustment Mechanism) as part of its Fit for 55 policy (European Commission, 2022). The purpose of a carbon border tariff is to counteract potential carbon leakage from the sectors that are part of the EU's emission quota trading system (EU ETS). Through a carbon tariff, importers of goods to the EU will have to buy carbon certificates for all greenhouse gas emissions at a price corresponding to the quota price in the EU ETS. If non-EU producers can show that they have already paid a price for the carbon emissions for the imported goods from a country outside the EU, the corresponding cost should be deducted. The carbon border tariff should cover a broad range of imports of products and commodities covered by the EU ETS, including when embedded in intermediate or final products. Initially, the suggested carbon tariff policy will only be applied to direct greenhouse gas emissions from use of fossil fuels in production. Indirect emissions from production of electricity may be included when a reporting system has been established. We analyse the effects of introducing a CBAM inspired by EU's proposed CBAM for the small open economy Norway and the larger coalition EU, where extensive carbon policies already exist and Norway's carbon policies are linked to EU's.

Methods

We analyse the effect of CBAM with Statistics Norway's World model, SNOW-Global, which is a global multi-region multi-sector computable general equilibrium (CGE) model, see e.g., Fæhn and Yonezawa (2021). The model is based on GTAP (Global Trade Analyses Project) data, with Norway as a separate country. While the database includes 140 regions and 57 sectors, the project mainly studies the effects on Norway and the EU, with key trading partners. All industries that are subject to or affected by the carbon tariff are explicitly represented in this study. The effects of introducing CBAM in Norway and EU are compared to a reference simulation of the global economy in 2030. This reference simulation includes existing carbon policies in the EU and Norway and the updated nationally determined (emission reductions) contributions (so-called NDCs) under the Paris Agreement (2015) for all other countries and regions. The NDCs in each region is met by a regional emission price. Based on the carbon policies and CBAM design suggested by the EU Commission and the Parliament, we design and analyse three policy scenarios: A TARIFF scenario that introduces CBAM and removes all OBA, the NOLEAK scenario without any explicit anti-leakage policy measures, i.e., without CBAM or OBA, and the HYBRID scenario where the carbon tariff only applies at a rate of 50 per cent while the OBA rate is reduced to 50 per cent of the baseline full rebate. The HYBRID scenario represents the scheduled phase-out of OBA and phase-in of CBAM. The NOLEAK scenario isolates the effects of only removing OBA, which is a necessary decomposition in order to better grasp the mechanisms in the TARIFF scenario.

Results

We find that the effects of introducing CBAM as in the TARIFF scenario are positive for sectors that are part of the EU Emission trading system (ETS) that do not receive free quotas (OBA) initially as electricity, while sectors initially receiving free emission quotas as non-ferrous metals, iron and steel, chemical products and refined oil products experience a negative output effect when their free quotas are substituted by CBAM on direct emissions. The negative activity effect ranges from -0.7 per cent for refined petroleum products and non-ferrous metals, -1.2 per cent for iron and steel, to -2 per cent for chemical products. The NOLEAK scenario shows the isolated effects of only removing OBA. The activity in all CBAM sectors fall, mainly driven by the sector's initial emission intensity and how the prices of intermediates (in particular OBA goods) are affected by the removal of OBA. In the HYBRID scenario the effects on the carbon tariff sectors lie somewhere in between the reference simulation and the TARIFF scenario for the sectors that have free quotas in the reference. Electricity has full carbon tariff and no free quotas in the HYBRID scenario since they have no free quotas initially and experience a similar production increase as in the TARIFF scenario. While the global emissions fall in both the TARIFF and HYBRID scenario, the macroeconomic effects for Norway and EU are very small in all the policy scenarios, including minor changes in the EU ETS quota price between the scenarios.

With the updated carbon policy for Norway, EU and the rest of the world, including that Norway is part of the EU ETS and has linked its climate policies to the EU, our results differ substantially from Böhringer et al. (2015) that found large negative effects for Norway of introducing carbon tariffs in a situation with unilateral carbon policy for Norway. We find that for a small open economy as Norway, that has most of its imports from Europe with the same carbon policies, the effects of CBAM are but minor. The effects are quite similar for both Norway and the European region. In line with Böhringer et al. (2015), however, we also find that the impact of CBAM on the emission-intensive and trade-exposed industries are most pronounced. Some ETS output and emissions are reallocated from Norway to Europe. Global production activities are moved from more carbon-intensive regions outside Europe to less carbon-intensive regions as Europe and global emissions are reduced, but the effect is small. Hence, introducing CBAM on direct emissions is mainly a policy to level the playing field for trade exposed industries, with minor effects on global emissions.

Conclusions

This paper examines the EU's recent proposal of carbon tariffs and potential direct and indirect effects for the Norwegian economy and affected industries. The purpose of CBAM is to counteract potential carbon leakage from the EU ETS sectors following the tightening of the emission cap in EU ETS and the planned phase out of free output-based emission quotas (OBA). We find that global production activities are moved from more carbon-intensive regions outside Europe to less carbon-intensive regions as Europe and global emissions are reduced, but the effect is small. Hence, introducing CBAM on direct emissions is mainly a policy to level the playing field for trade exposed industries, with minor effects on global emissions. EU suggests including indirect emissions in the CBAM in the future. For many goods, electricity is an important input into production, accounting for a significant share of the total carbon footprint of producing these goods. There are huge differences in emission intensities in the electricity sector between the regions with Norway as the lowest, compared to EU and in particular the rest of the world where fossil fuels as coal and gas are still significant inputs in the electricity sector.

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