Sigit Perdana, Marc Vielle

How Many Jobs the EU CBAM Can Save: A Regional Perspective

Sigit Perdana, LEURE Laboratory, Ecole Polytechnique Fédérale de Lausanne (EPFL),
CH-1015 Lausanne, Switzerland.
sigit.perdana@epfl.ch

Marc Vielle, LEURE Laboratory, Ecole Polytechnique Fédérale de Lausanne (EPFL),
CH-1015 Lausanne, Switzerland.
marc.vielle@epfl.ch

Overview

The EU climate neutrality target requires substantial changes in the energy system, and the transition toward deep decarbonisation might adversely affect economic activities. The proposal to implement the Carbon Border Adjustment Mechanism (CBAM) aims to support this transition by putting a fair price on the carbon emitted during the production of energy-intensive goods imported to the EU, boosting the competitiveness of the European industries. While the current analysis of the implementation of the CBAM focuses mainly on the EU aggregated level (Mörsdorf, 2022; Perdana and Vielle, 2022; Clora et al., 2023), the effectiveness of CBAM should be scrutinised by the Member States (MS) level. The introduction of the CBAM is aligned with the phase-out of the allocation of free allowances under the EU Emissions Trading System (ETS), and it can have quite differentiated impacts within a country at the regional level (Mura et al., 2021). Following this wide consensus of different policy impacts between sectors, groups, and geographical regions (Hansen and Coenen, 2015), this paper focuses on the EU fit for 55 and the climate neutrality target affecting labour employment in EU Energy Intensive Industries (EII). It is followed by evaluating the effectiveness of CBAM to minimise the adverse impact. Understanding how each MS will be affected differently at their regional level is critical to improving the political acceptability of CBAM. The potential effect of a lack of employment opportunities and industrial decline to achieve deep decarbonisation targets are fundamental drivers of the anti-EU vote (Dijkstra et al. 2020). An increase in inequality among regions can intensify opposition against European policies and the EU construction itself.

Methods

The methodological approach used for this analysis is through linking Aggregated National Model of Computable General Equilibrium (CGE) with Geographic Information System (GIS) approach. We use the GEMINI-E3 (Bernard and Vielle, 2008), a recursive dynamic CGE model with backward-looking (adaptive) expectations incorporating a multi-country, multi-sector. This version is built on the GTAP 9 database (Aguiar et al., 2016), with 2011 as the reference. The spatial decomposition describes each of the EU 27 MS alongside the United Kingdom, United States, China, and the rest of the World. Linkage on the regional level covers regional employment databases at NUTS (Nomenclature of Territorial Unit of Statistic) from Eurostat (Eurostat, 2018). The focus is the employment level of CBAM sectors (EII) at NUTS2 (Basic regions for applications for regional policies). There are approximately 300 regions within the EU linked in this analysis.

Scenario development is built on 2011-2030 with yearly time steps with all prices given in €2017, starting with the reference case. This scenario implicitly considers all previous policies implemented since 2015, emphasising those related to energy and climate fields. Macro assumptions are based on the EU reference scenario 2016 (European Commission, 2016), while GDP growth rates for MS follow the projection of DG-ECFIN (European Commission, 2015). This scenario is then developed by integrating the newest EU climate target of Fit for 55, followed by the introduction of CBAM with all of its potential implementation scopes. Impacts on regional employment are then quantified, followed by a comparative analysis to Fit for 55 scenarios to examine how many jobs are saved with CBAM implementation and what regions are significantly affected by this policy instrument.

Preliminary Results

- EU Fit for 55 policy results in 491,000 job losses in EII sectors of EU27 in 2030. This corresponds to a reduction of 6.8% relative to the baseline scenario. The number grows close to 550,000 once the United Kingdom is included.
- Job losses are concentrated in a limited number of regions, mostly in Germany, followed by France and Italy. Together results in regions of these countries represent 48.8% of the EU jobs.

- Further simulation with CBAM scenarios proves all regions gain benefits. Despite not entirely offsetting the adverse effect of EU Fit for 55, the EU CBAM will save 266,000 jobs in the EII sector in 2030.
- Jobs saved are less concentrated compared to the regional distribution of job loss due to implementing Fit for 55 without CBAM. Benefited regions are spread from Germany, Italy, Poland, Spain, the Czech Republic, France, and Portugal.

Preliminary Conclusion

Our analysis of the impact of EU CBAM on the internal EU proves the effectiveness of this new policy instrument in boosting EU competitiveness of the CBAM-related sector of EII. Focusing on the number of jobs lost caused by the EU's more ambitious target of fit for 55 and reaching climate neutrality in 2050, CBAM is effectively restoring the adverse effects on labour employment in the EU EII sector. Conditional upon the EU's chosen scope, carbon pricing on EU imported goods based on direct emissions and electricity used could save almost 50% of job losses in EII in almost all EU regions.

References

Aguiar, A., Narayanan, B. and McDougall, R., 2016. An overview of the GTAP 9 data base. *Journal of Global Economic Analysis*, 1(1), pp.181-208.

Bernard, A. and Vielle, M., 2008. GEMINI-E3, a general equilibrium model of international–national interactions between economy, energy and the environment. *Computational Management Science*, 5(3), pp.173-206.

Clora, F., Yu, W. and Corong, E., 2023. Alternative carbon border adjustment mechanisms in the European Union and international responses: Aggregate and within-coalition results. *Energy Policy*, 174, p.113454.

Dijkstra, L., Poelman, H. and Rodríguez-Pose, A., 2020. The geography of EU discontent. *Regional Studies*, *54*(6), pp.737-753.

European Commission., 2015. The 2015 Ageing Report: Economic and budgetary projections for the28 EU Member States (2013-2060). Directorate-General for Economic and Financial Affairs.

European Commission, 2016. EU Reference Scenario 2016.

Eurostat., 2018. SBS data by NUTS 2 regions (NUTS 2006) and NACE Rev. 1.1. Available at: https://ec.europa.eu/eurostat/databrowser/view/SBS_R_NUTS03/default/table?category=sbs.sbs_r.sbs_r_

Hansen, T. and Coenen, L., 2015. The geography of sustainability transitions: Review, synthesis and reflections on an emergent research field. *Environmental innovation and societal transitions*, *17*, pp.92-109.

Mörsdorf, G., 2022. A simple fix for carbon leakage? Assessing the environmental effectiveness of the EU carbon border adjustment. *Energy Policy*, *161*, p.112596.

Mura, M., Longo, M., Toschi, L., Zanni, S., Visani, F. and Bianconcini, S., 2021. The role of geographical scales in sustainability transitions: an empirical investigation of the European industrial context. *Ecological Economics*, *183*, p.106968.

Perdana, S. and Vielle, M., 2022. Making the EU Carbon Border Adjustment Mechanism acceptable and climate friendly for least developed countries. *Energy Policy*, 170, 11345.