European Policy Brief

GLOBAL IQ

Global competition and international trade.

INTRODUCTION

Policy context

Policy reforms needed to curb global emissions must necessarily be domestic. A nation's greenhouse gas output depends upon what it produces, how it produces and how much it nation consumes. Domestic policies such as taxes, subsidies and regulation are the principle means of changing consumption levels, and production methods and levels.

Nevertheless a nation's trade pattern is nothing more than imbalance between its production and consumption patterns. This means that here is an ineluctable, two-way connection between domestic climate policies and international trade. First, a nation's climate policies that affect production and consumption will affect its trade pattern. Second, the production and consumption effects of a nation's domestic climate policies will be influenced by the climate policies – or lack thereof – of its trade partners.

As a result of this inescapable economic logic, there is an enduring interest in the role that trade policy plays in helping or hindering the transition to a low-carbon future.

This interest is amplified by policy asymmetries that are now firmly embed in the global response to climate challenges. The principle of 'common but differentiated responsibilities' in the United Nations Framework Convention on Climate Change (UNFCCC) allows developing countries to intervene on their domestic emissions at different speed relative to developed nations, hence generating an intrinsic asymmetry in the global arena.[1]

Two principal concerns arise: the competitiveness impact on domestic firms when one nation maintains stricter policies than its trading partners, and 'carbon leakage', i.e. the notion that the effectiveness of one nation's policies are diminished by a substitution of foreign production/emissions for domestic production/emissions.[2]

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[1] See on this Zhang (2012).

[2] If abatement is not pursued uniformly across the world, the carbon leakage rate in non-abating countries is defined as the change in its emissions as a fraction of the emissions reduction by the abating regions. Then the global leakage rate is, simply, the sum of the regional leakage rates (Babiker 2005).

This interconnected prodution problem is in no way novel to policymakers. The world has for long been linked through international trade and countries have always been asymmetric in their regulatory regimes, taxation, labour standards, etc. As a result, competitiveness is already affected by non-climate policy asymmetries. In particular, pollution standards are already one factor that determines competitiveness and production allocation. For instance, evidence suggests that firms may relocate their productive activity from countries with strict environmental policies to those ith laxer policies.[3]

One of the aims of the **GLOBAL-IQ** project was to provide a framework to analyze the linkage between global changes in climate, unilateral and global carbon policies and international trade and competitiveness. The focus was placed on defining the existing evidence about carbon leakages and competitiveness policies, on integrating trade modules in broader models of the global economy, and on modelling theoretically how differences at the firm-level can be significant for these policies and for global environmental outcomes.

KEY OBSERVATIONS

Global trends in climate and trade policy

International negotiations on binding, internationally-coordinated climate targets have failed to date. This implies that nations pursue national climate change policies that are only partially coordinated. As the ultimate object of these policies is to raise the cost of carbon emissions, different nations assign different shadow price to carbon; in turn, this is bound to affect the international competitiveness of energy intensive industries, especially those that are more exposed to trade.

Such **competitiveness effects** on trade-exposed, energy-intensive industries create political economy forces that typically result in national tariffs and subsidies designed to offset the competitiveness losses and protect the domestic firms from “unfair” foreign competition from those countries that do not price carbon.

In the EU and Japan, for example, energy intensive industries exposed to international competition have been awarded free allowances of carbon permits to avoid raising their costs. The same outcome was observed with the US Super Fund tax on chemical-using industries and the Montreal Protocol on Ozone Depleting substances.

[3] This is the so called Pollution Heaven Hypothesis, formulated by Copeland and Taylor (1995).

These tariffs and subsidies are often justified as limiting carbon leakage, but in fact they are largely driven by special interest politics and do not necessarily improve global outcomes in terms of emissions or efficiency. So, are carbon leakages really large? And what are the policies that could be used to counteract them?

Carbon leakage and competitiveness

The first step in quantifying the competitiveness loss is to identify how different carbon policies affect firms' costs. Total costs are usually quantified using two classic sets of indicators:

1. Carbon costs (or value at stake): the sum of all of an industry's costs (including the indirect cost of an increase in the price of electricity), as a fraction of operating profits, value added or turnover. Overall, an energy-intensive industry[4] would face a significant increase in their costs, but the damage to overall GDP and to the labour force would still be tiny[5].

2. Trade exposure, i.e. imports plus exports over total domestic market, or turnover.

The European Union has granted an extremely generous allowance scheme to compensate for carbon leakages, especially because of trade exposure, which is not directly related to carbon.[6] However many other issues create a concern for domestic industries, for instance the potential pass-through of compliance-related costs by upstream producers of inputs into the manufacturing process. Other considerations to identify which firms should suffer most are:[7]

i. Investment options, i.e. if firms are very capital intensive, they might require lots of new investments to comply with carbon regulation.

ii. Products differentiation and market segmentation.

iii. Transportation costs after the increase in the cost of carbon.

iv. Customers reaction to a price increase, depending on vertical integration of industry, quality issues, long term contracts.

v. Legal and political environment.

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[4] A European Commissions Directive (EU-ETS 2009/29/EC) explains how to identify the sectors at risk of carbon leakage, based on carbon cost and trade exposure. This identification is key in allocating free allowances for carbon emissions, therefore a strong lobbying pressure exists around the criteria to define them (EC 2011). Similarly for the USA (McMakin 2009).

[5] See Ellerman et al. (2010) for the EU, Aldy and Pizer (2009) for the USA.

[6] Martin et al. (2012)

[7] Dröge et al. (2009)

COMPETITIVENESS POLICIES

Protectionism or leakages' concern?

In determining the proper response to competitiveness concerns, policymakers must be able to evaluate which of these factors matter more for a country's firms. This entails specific analysis on how the domestic industries are affected by carbon regulation.

Note, however, that the choice to subsidize domestic firms or to impose trade restrictions can be justified only partly by an environmental motivation, and particularly using the idea of carbon leakages to offset competitiveness loss. Most studies estimate values of leakage only between 5-20%, so indeed some of the effort to reduce emissions gets "wasted", but in a very small proportion.

The two macro-categories of unilateral intervention that a country can adopt to protect industries at risk of competitiveness damages are **output-based allocations** (including grandfathering) and **border tax adjustments**. The former consists of allocating emission permits in various ways to those firms that would be most damaged, usually based on their productivity.[8] In the case of grandfathering, (free) allocation depends on past emissions. The welfare costs of these exemptions can be quite substantial.[9] Table 1 below illustrates how most of the possible output allocation policies create distortions and inefficiencies.

Table 1 - Distortions from (free) allowance allocation

Allocation Method	Impacts on	Expenditure on extending plant life relative to new build		Plant operation		Energy efficiency investments and demand substitution	
	Distortions	Discoura-ge plant closure	Bias towards higher emitting plant	Encoura-ges an increase	Bias towards higher emitting plants	Lower incentives for producers	Lower incentives for consumers
Grandfathering with Benchmarking	Capacity only	X					(X)
	Capacity by fuel/plant type	X	X				(X)
Grandfatherin	Output only	X		X			X

[8] Quirion (2009) outlines the various controversies about the effects of these allocations.
[9] Böhringer and Rutherford (1997)

g with updating from previous periods	Output by fuel/plant type*	X	X	X	X		X
	Emissions	X	X	X	X	X	X
Output-based (undifferentiate d) allocation or rebates	Final product	X		X			XX
	Intermediat e product (eg. clinker)	X		X		XX	XX

Note: X indicates a distortion arising from the allocation rule. (X) indicates that distortion may depend upon market/pricing characteristics of the sector. XX indicates magnified distortions.[10]

Border tax adjustments, on the other hand, aim at leveling the playing field for domestic firms with respect to firms from those countries that do not implement the same level of abatement. The intervention can take many forms (see Table 2 below) and can be on the import side, adjusting competitiveness for domestic consumption, or on the export side, or both. Adjustments at the border are highly debated as they can be conflicting with WTO provisions[11].

Table 2 Climate and trade policy aspects of border carbon adjustments

Trade Policy Instrument	Climate Policy Aspects	Trade Policy Aspects
I: Taxes/Tariffs		
Tax/Tariff on carbon-intensive imports	Levelling upwards; Basis for carbon intensity needed; A stick for engaging free riders	Levelling of carbon costs vis-a-vis third parties should be based on national treatment and MFN* principles; Similar to VAT** destination principle; Revenues remain with importer
Rebates for carbon-taxed exports	Levelling downwards; No carbon price effect for consumers abroad	
Export taxes	Levelling upwards; Price signal abroad; Address financial needs of major exporters from emerging and developing countries	Export taxes are not prohibited under WTO law; Revenues remain with exporter
II: Allowances		

[10] Adapted from Neuhoff (2008) and Dröge (2009)
[11] Zhang (2012, Section 5).

Importers need to buy and surrender allowances	Levelling upwards; Basis for carbon intensity needed; Type of allowances needs clarification (International offsets,	Extraterritorial application of national/regional climate policy; national treatment and MFN* principle need to be met
Exporters are exempt from surrendering allowances	Levelling downwards; No carbon price effect for consumers abroad	Needs to meet SCM*** requirements
III: Cost compensation for trade-exposed producers		
Direct compensation	Levelling downwards without targeting actual trade activity	Needs to meet SCM*** requirements
Free allocation		

1. *MFN= most favoured nation
2. **VAT = Value Added Tax
3. ***SCM = Agreement on Subsidies and Countervailing Measures (WTO)[12]

A number of studies aim at comparing these policy options.[13] Both interventions can be quite effective in protecting the domestic industry, but they create large economic distortions and their impact may vary in terms of leakages. However, any trade policy instrument that reduces the liberalization achieved over decades of negotiations in the WTO distorts global markets and can only reduce the efficient allocation of productive technologies, even for green products.

RECOMMENDATIONS FOR POLICY-MAKERS

Integrating trade policies in a global agenda

The global approach taken by this project, Global-IQ, allows some broad considerations and some specific insights with respect to the problem of competitiveness in international trade when global issues such as climate change are raised on the world's agenda. First and foremost, it is important to integrate considerations about trade policy and carbon policies in a broader framework that accounts for other major global trends such as demographics, technology, development, and governance, to mention just a few of the issues explored in this project. This can be done with the use of different integrated assessment models (IAMs) that can accurately reproduce trade flows among nations using the existing theoretical frameworks,

[12] Source: Dröge et al. (2009)

[13] Monjon and Quirion (2011), comparing border tax adjustment versus output based allocations, find that the latter is more effective at containing competitiveness losses in those sectors that are affected by the EU ETS . Similarly Rivers (2010) reaches the same conclusion for the case of Canada. Van Asselt and Brewer (2010) compare the US and the EU and propose to go beyond formal negotiations only, but also try to develop an international learning processes to compare the respective cap-and-trade systems.

in order to predict the global changes and impacts we could observe in the future. In the project, several of the IAMs used had a trade module (ICE, MagPIE, WITCH, GLOBIOM, REMIMD, etc.) that allowed for an analysis of the effect of trade protectionism and barriers.

Firm level effects

Furthermore, beyond the general recommendation to consider trade policies and climate policies in integration with the other socio-economic elements of a globally evolving planet, GLOBAL-IQ produced some specific theoretical contributions to highlight important elements of trade policy in relation to carbon spillovers. In particular, it emphasized the fact that **firms** within a country are not all the same, therefore policies impact each firm differently. This heterogeneity in the productive structure makes it even more likely that protectionist measures will end up subsidizing dirty domestic firms. Consider for example the fact that *the best* Chinese mills – i.e. the newest ones – are more efficient than the average Japanese mill, even if *on average* China is dirtier in production than Japan. Thus raising the carbon price in Japan above that of China may have a negative competitiveness effect on Japanese steel firms, but a positive impact on carbon emissions. The point is that the policy drives out the oldest, least efficient Japanese plants, replacing them indirectly by new, more efficient Chinese firms. Trade protection from the side of Japan would only slow down this international replacement process of less efficient firms (which also tend to be the dirtiest ones). Therefore, even if the justification that Chinese production is more pollution and competes “unfairly” with Japanese firm, which might be more regulated on environmental standards, in fact trade barriers would only be a protectionist measure for old, dirty Japanese firms.

This example illustrates one of the many real-world competitiveness and leakage issues than should be addressed considering the fact that firms are not all the same and policies affect not only firms that operate at the average, but firms which may have very different characteristics.

The message from the global analysis of trade competitiveness in relation to other global macro trends is then fundamentally to consider how damaging it could be to revert to a world of protectionism, not only for efficiency in production, but in many cases also for the environment itself. This is a particularly relevant for the European Union, which has always defined itself on the basis of free trade, but also needs to be a champion of green growth and climate change mitigation policies.

PROJECT IDENTITY

Coordinator	Fondation Jean-Jacques Laffont / Toulouse School of Economics
Consortium	FEEM / IIASA / PIK / UGOT / CUNI / ISIS / LSE / HEID / WIIW / CEPR
EC contact	Domenico ROSSETTI di VALDALBERO
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Website	www.global-iq.eu
For more information	global-iq@tse-fr.eu