

Selected International Aspects of Carbon Taxation

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In accord with the principle of “common but differentiated responsibilities” (CBDR) enshrined in the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol did not require developing countries to reduce greenhouse gas (GHG) emissions. Because producers in exempt countries would have an artificial competitive advantage, the U.S. rejected the Protocol. Also, increased emissions in non-committing countries could partially offset emissions reductions in committing countries, creating competition-related carbon leakage. (Leakage also occurs because lower fossil fuel consumption in committing countries leads to lower world fuel prices and increased fuel consumption in non-committing countries. This type of leakage, which most models show exceeds competition-related leakage, is affected minimally by BCAs. It is not considered here. Nor are possible sources of negative leakage.) Post-Kyoto voluntary approaches also risk negative competitive effects and leakage.

Fears of competitive effects and leakage led to inclusion of “border carbon adjustments” (BCAs) in US legislative proposals for a cap and trade system and in a directive modifying the European Union’s Emissions Trading System (ETS). Imports would pay the same carbon price as domestic products and exports might be exempt from paying it. But BCAs involve serious economic, administrative, and legal issues. Also, developing countries objected strongly to the EU’s attempt to extend the ETS to international aviation and might challenge the legality of BCAs before the World Trade Organization (WTO), and attempting to use BCAs to induce countries to price carbon might backfire, precipitating a trade war. (BCAs have been likened to

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anti-dumping measures, often used for protection of industries now seeking BCAs.) This paper attempts to untangle some of the non-political issues related to BCAs for carbon taxes.

References to the voluminous literature are necessarily incomplete.

The next section describes three prototypical systems of taxing all CO₂ released in combustion. Section II discusses issues arising in designing and implementing BCAs if only some countries tax carbon. Section III discusses legal issues. The final section concludes.

I. Three Globally Comprehensive Carbon Taxes

The marginal cost of combustion-related CO₂ emissions could, in theory, be equalized across countries by levying carbon taxes in one of three ways. Simplest is for all countries to levy the same tax on the carbon content of *fossil fuels produced within their borders*. (Metcalf and Weisbach 2009 describe how production could be taxed.) There would be no BCAs.

Almost as simple is a uniform tax based on the *origin of emissions* related to fossil fuel combustion. Instead of monitoring emissions, an extremely complicated task, the production tax base could be modified to include fuel imports and exclude fuel exports. Non-fuel BCAs would not be needed.. Carbon released in industrial processes (e.g., in producing steel and cement), and credits for capture and sequestration of CO₂ and physical embodiment of carbon in products (e.g., asphalt) could be accommodated. Developing countries would reject this system, like binding Kyoto commitments, because advanced countries emitted most atmospheric CO₂, have higher per capital emissions, and have greater financial and technical ability to address climate change.

Destination-based taxation of emissions is vastly more complicated. To provide BCAs, it would be necessary to calculate the carbon content of internationally traded products. But carbon

intensity depends, inter alia, on production processes (e.g., basic oxygen or electric arc furnace in steel; wet or dry kilns in cement; mechanical or chemical pulping in paper), feedstocks (ore or recycled metal; gas or naphtha in chemicals; wood or recycled paper), energy sources (coal, oil, natural gas, or renewable), and technical efficiency. (Houser et al., 2008) There is no accepted methodology for calculating carbon content, data requirements are enormous, and many countries lack the capacity to administer such a system.¹ This systems is also a political nonstarter.

II. Cost-effective BCAs: A Holy Grail?

The situation is even worse if some countries price carbon, some do not, and the former want to impose BCAs. An acceptable BCA regime needs to accomplish economic objectives and be administratively feasible, WTO-legal, and politically acceptable. This may be impossible. (Zhang 2012 provides a useful survey of issues. See Asselt and Brewer (2010) for other limits on the effectiveness of BCAs.)

BCAs would do little to reduce global CO₂ emissions. They would do so only by preventing leakage. Carbon embedded in products of countries having no carbon tax that are not exported to countries with import BCAs would remain untaxed. This is most carbon. China, the bogey-man in debates over BCAs, emits far more carbon in producing for domestic consumption

¹That using life-cycle carbon footprints is wrong is easily seen. Suppose that domestic carbon footprinting properly considers only two sources of emissions, both subject to domestic carbon tax: manufacturing and disposal. Including the latter in import BCAs would double-tax carbon emitted in disposal. BCAs should mirror the amount of carbon tax collected on domestic products up the point that they compete with imports or are exported.

than for export. Branger and Quiron (2013, 10) note, “China will in all likelihood consume domestically more than 98% of its steel production and 99% of its cement production: the effects of BCA on Chinese production would then be very small.” See also Houser et al. (2008). I thus focus primarily on competitive effects and leakage.

Eliminating all negative competitive effects and carbon leakage would require BCAs on all internationally traded products. Because of compliance and administrative costs, this is not cost-effective. (Proposals for a “carbon added tax” analogous to the VAT seriously understate these problems.) A more pragmatic approach (such as in Cosbey et al. 2012) is necessary. In general, difficulties increase with the length and complexity of supply chains. Most analysts agree that BCAs should be limited to a few basic products that are *both* energy-intensive *and* trade-exposed (EITE) and that calculations of carbon content should include carbon embedded in purchased electricity but not that embedded in other inputs. Commonly listed EITE industries are cement, iron and steel, chemicals, petroleum refining, aluminum (a big electricity user), pulp and paper, and non-metallic mineral products (ceramics and glass). (See, for example, Houser et al. 2008; Dröge 2009; Adkins et al. 2012; Cosbey et al. 2012.) The first two have unusually high process-related CO₂ emissions from producing clinker (cement) and coke (steel).

Thus limiting the coverage of BCAs could place domestic producers of semi-finished and finished products, whose inputs pay the carbon tax, at a competitive disadvantage in both import and export markets. This impact would be greatest for chemicals, since trade in carbon-intensive chemical feedstocks is relatively unimportant, and small for cement, since construction is not traded. Steel and aluminum are intermediate cases. (Houser et al. 2008) This problem is easily overstated. Although the U.S. imported more steel incorporated in finished products than steel in

2005, Monjon and Quiron (2010) cite an estimate that a BCA of €30 to 50 per ton of carbon embedded in steel and aluminum incorporated a one ton car would raise the car's price by only €48 to 80. Moreover, application of BCAs to more products requires complicated rules of origin.

Negative competitiveness effects can take two forms: reduced market share and reduced profitability. By pricing carbon embedded in imports and exempting carbon embedded in exports, BCAs prevent leakage and protect market share directly, thereby protecting profitability indirectly. Free allocation of permits in cap and trade systems protects profitability directly, but does not protect market share or prevent leakage, because it does not affect the cost of marginal CO₂ emissions. (Free allocation of permits is tantamount to distributing cash. Permits have a market value and thus an opportunity cost, even if received free of charge.) Infra-marginal exemptions from a carbon tax would have similar effects (especially if transferable). Marginal carbon tax exemptions would protect market share and profitability and prevent leakage, but undermine environmental objectives.

Import BCAs might appear to be most effective if based on the actual carbon content of individual firms or even particular installations. But Implementing them is complicated; it would likely require emissions monitoring by exporting countries, which may not occur. Moreover, the net impact of import BCAs based on the actual carbon content might be small, because of the incentive to export the least carbon-intensive output and consume the most carbon-intensive.

BCAs intended to eliminate negative competitive effects would be based on the carbon intensity of domestic production. Whether imports are more – or less – carbon intensive would be irrelevant. But basing BCAs on this rule would result in protection of domestic products that are more carbon-intensive than imports. To prevent adverse competitive effects and leakage,

without creating protection, BCAs should be based on the lower of the carbon content of production in the importing country and in the exporting country. This rule has two significant benefits. It greatly simplifies compliance and administration; it is necessary to know the carbon intensity of imports only if it is less than that of domestic products. Prospective exporters would be anxious to report actual carbon content in that case. The WTO would also be more likely to condone BCAs; see below.

Not all domestic production of a given product is equally carbon-intensive. A reasonable starting point for setting import BCAs – one the WTO might accept – would be either average carbon intensity or the carbon intensity of the “predominant method of production” (PMP) in the importing country. Proof of lower carbon intensity would be allowed. (An alternative would be to use benchmarks only if exporters did not provide verified data on carbon intensity; see Cosbey et al. 2012.) The WTO is unlikely to accept BCAs based on average carbon content in exporting countries. Export BCAs would presumably be based on actual carbon content, but basing them on average domestic carbon intensity would create greater incentives to reduce emissions.

Countries taxing carbon could impose BCAs on imports from all countries and grant export BCAs, leaving it up to exporting countries to do the same. This is how value added taxes (VATs) work. But BCAs for VATs do not raise the same issues. Administrative and compliance costs could be reduced by applying BCAs only to trade with countries not levying a similar carbon tax or comparably reducing emissions in other ways. But rules to prevent transshipping through exempt countries – difficult to implement in the case of basic products – would be required. This approach also raises WTO issues; see below. It would cost little to exempt imports from low income countries, which do not export the type of products likely to be subject to

BCAs. Also exempting trade with developing countries, especially those from the BASIC countries (Brazil, South Africa, India, and China) would essentially eliminate BCAs.

III. WTO Issues

International trade rules were not drafted with environmental concerns in mind. Whether the WTO would condone BCAs is unclear. The consensus of experts seems to be that BCAs for carbon taxes could pass muster if carefully designed. Even if found to violate the basic trade rules, BCAs might qualify for a special exception under Article XX of the General Agreement on Tariffs and Trade (GATT). (Issues can only be sketched here. For exhaustive discussions and references, see Pauwelyn 2013 and Holzer 2014.)

A. The Basic Rules

A threshold issue is whether carbon taxes are direct taxes or, as seems likely, indirect taxes; only the latter are adjustable. A second key concept is the definition of “like products.” Discriminatory treatment of trade in like products among GATT signatories is not allowed (“most favored nation”– MFN – treatment), and BCAs cannot exceed taxes on “like domestic products” (“national treatment” and subsidy rules).

Carbon taxes are commonly said to be based on “process and production methods” (PPMs), not products. Even so, WTO decisions in two cases involving PPMs (*Superfund* and *Shrimp-Turtle*) and the lack of challenge to the US tax on ozone-depleting chemicals, suggest that BCAs might not be per se illegal just because carbon taxes are not levied on products.

The WTO is not likely to find that BCAs based on the actual carbon intensity of imports

are levied on like products. Its WTO Appellate Board has found that likeness depends on end-uses, the properties, nature, and quality of physically identical products, tariff classifications, and the degree of substitutability or competition. None of these depends on carbon intensity, especially in the case of basic products. Basing BCAs on average carbon intensity in the exporting country, as in U.S. legislative proposals, would likely violate MFN.

In the *Superfund* case the WTO Panel approved an import adjustment based on US PMP, with the option of basing it on the actual method of production. Similarly structured import BCAs for carbon taxes might be acceptable. This approach would prevent protectionism and avoid the complexity of basing BCAs on actual carbon content, which itself might be considered a disallowed impediment to trade. [*Need to consider US gasoline]

Basing BCAs on “best available technology” (BAT) would help assure WTO acceptance. But BCAs could be much lower, the reduction of negative competitive effects and leakage could be smaller, and there could be domestic political opposition. Moreover, use of BAT begs a host of thorny technical questions, aside from the geographical scope of the test (BAT in the exporting country, in the importing country, or worldwide). A given product may be produced using more than one technology. Particularly important is the treatment of electricity. Hydro, solar, wind generation, and some renewable fuels are essentially emission-free. But the source of power taken from the grid is unknowable. All things considered, PMP or average carbon intensity in the importing country, with the option to use actual carbon intensity, seems a better choice for import BCAs. But, given international variations in the carbon content of electric power, it might be appropriate to base that component on average carbon content in the exporting country. (See Cosbey et al. 2013.)

Export BCAs could be based on actual carbon content, but that would encourage export of the most carbon-intensive output. Basing them on PMP, average carbon content, or BAT in the exporting country creates greater incentives to reduce emissions, but the former two could constitute an illegal subsidy for some producers.

B. Article XX Exceptions

BCAs that violate the basic trade rules might be salvaged by an Article XX appeal, a two-step process. First, one of specified exceptions must be satisfied. That for provisions “relating to the conservation of exhaustible natural resources” is generally thought most relevant, but some believe that the one for provisions “necessary to protect human, animal or plant life or health” could be applied. It would be important to emphasize reduction leakage; predicating BCAs on competitiveness concerns could doom an Article XX appeal. (This might be easier for a carbon tax than for a cap and trade system. With a fixed national emissions cap, leakage cannot occur.)

Second, to satisfy the *chapeau* (headnote), the provision must not be “applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade.” Participation in activities under the UNFCCC would help demonstrate that any discrimination was not arbitrary or unjustifiable. Import BCAs based on higher than actual carbon content would almost certainly be seen as “a disguised restriction on international trade.”

Not applying BCAs to trade with developing and low income countries could perhaps be justified as consistent with CBDR. Moreover, “the same conditions” arguably do not exist there and in advanced countries. But exempting imports from developing countries would negate the

objective of BCAs.

Conditioning BCA exemptions on participation in international agreements on climate change would violate the basic trade rules, but might sustain an Article XX challenge. This would also eviscerate BCAs, as most developing countries signed the Kyoto Protocol.

Exempting imports from nations levying equivalent carbon taxes (or using a cap and trade or other system to reduce emissions comparably) is a prima facie violation of MFN treatment, but could perhaps be rescued by arguing that “the same conditions” do not exist in countries that do and do not comparably limit emissions. In theory a credit could instead be allowed against import BCAs for taxes on carbon (and the cost of emissions permits) embedded in imports. This would be administratively cumbersome, and could not easily be extended to non-price systems.

C. The Difficulty of a Political Solution

Whether the WTO would condone BCAs cannot be known until it is faced with litigation. The WTO would not welcome such litigation, as a decision could undermine its authority with either developing or advanced countries. It would be better to alter the legal framework under which such cases are decided. There is, however, no easy way to do that. Developing countries would block an attempt to modify either the trade rules or the climate change rules to allow BCAs. One possibility is to rely initially on bilateral and plurilateral agreements, hoping that the network(s) of agreements could be expanded, as happened with the GATT. (Holzer 2014)

IV. Concluding Remarks

The environmental, economic, administrative, legal and political challenges discussed

above are serious. BCAs may not be the best – or even a good – way to attack negative competitive effects and leakage. Sectoral approaches may be preferable. They could coincide more with desires of developing countries to curtail emissions for domestic reasons (e.g., China’s desire to shift away from energy-intensive heavy industry for health reasons) and would not raise the same issues of economic imperialism. See Houser et al. 2008.

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