

# Development Economics, Trade Policy and the Global Environment

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**1. Introduction.** I confine my attention to two issues. First, I discuss the effects of environmental policy objectives on trade and welfare. Second, I show how trade agreements can be integrated with environmental concerns and particularly how the production of and international trade in carbon-intensive outputs can be sensibly regulated. Some discussion is related to China.

**2. Environmental threats to trade.** Environmental concerns are seen by some as a threat to the continued growth of world trade. This continued growth is seen as improving the economic welfare of nations so that the pursuit of environmental objectives is seen by some as restricting the range of possible trades and thereby impeding sought after welfare gains. These implied losses are seen as particularly important for developing countries who seek higher standards of non-environmental consumption per capita and who place a relatively low valuation on the natural environment.

This is an unsound economics. The efficiency case for internalizing global external costs is premised on maximizing global economic welfare. Internalizing externalities, such as those associated with greenhouse gas emissions (GGEs), maximizes global welfare and, provided the right compensations are paid, will advantage all. This case is not diminished by the fact that some countries in the developing world might have low willingness-to-pay for environmental quality. Just as it does with respect to externalities in a closed economy with poor and wealthy citizens, it makes sense to internalize external costs by attaching a uniform price on the externalities and by then addressing particular distributional concerns using compensatory transfers. This isn't just abstract economic theory. If one considers the forthcoming UN climate change negotiations in Copenhagen, the issues are as much about

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negotiating compensations, development assistance and finance to developing countries from developed countries as they are about mitigating GGEs. This is as it should be.

There are global inefficiency costs if trade expands along with trade-induced external costs. The global gains from trade are less than they would be with appropriate policies for addressing the externalities. This should be the starting point for thinking about environmental issues.

This does not mean that it is easy to come to agreement on globally optimal environmental policy with compensatory transfers. There are difficulties if incentive issues limit the willingness of individual nations to enter into such an agreement even if it is collectively rational to do so. Such incentive issues limit the potential for unilateral commitments to such an agreement for 'Tragedy of the Commons' or 'Prisoner's Dilemma' reasons.

The difficulties of achieving an international agreement to mitigate GGEs are based on the existence of:

- (i) Developing countries for whom the economic gains from not mitigating GGEs plus the carbon leakage gains received (corresponding to the leakage losses incurred by countries which do mitigate) exceed the gains these countries would get from mitigating emissions and perhaps receiving compensatory transfers;
- (ii) Developed countries for whom the gains from mitigation less carbon leakage losses (to non-mitigating countries) are recognized to be less than the costs of making compensatory transfers.

I argue below that the problem of carbon leakages can be dealt with by appropriately defining the GGE base in terms of national consumption rather than production. Then, even ignoring the issue of the willingness of developed countries to pay compensations, it can be argued that there remain strong arguments for unilateralist pursuit of mitigation. In short, the objections to unilateralism, when subject to scrutiny, are less persuasive than might at first be thought.

There are three reasons for this:

First, with respect to 'large' countries (China, India, 'EU', United States, for whom GGEs in each country comprise around 20 per cent of total GGEs, individual country mitigation decisions provide some direct climate control benefits to the country that mitigates. For example, China's mitigation of Chinese GGEs provides perceptible climate control benefits to China. This is particularly so because of the very substantial costs a country like China would face with unmitigated climate change particularly with respect to water supply issues in rural areas.

Second, carbon control measures provide some 'no regrets' benefits, unrelated to climate control, in countries which incur local air pollution problems, such as SO<sub>2</sub> pollution. China,

for example, has substantial air pollution problems in its major cities - it is claimed that 16 out of 20 of the world's most polluted cities are in China. The World Bank has estimated the human and economic costs of this air pollution to be substantial (World Bank, 2007). The pollution reflects in large part increased atmospheric SO<sub>2</sub> concentrations associated with burning coal for electricity generation. The claimed costs of such pollution have proven controversial but there is no question that there are substantial 'no regrets' environmental benefits from GGE reductions that simultaneously reduce SO<sub>2</sub> emissions.

Third, for countries whose emissions significantly impact on global GGEs there is a strong *a priori* case to address the prospects of catastrophic risk. If a country implements a cost-benefit study to assess the case for mitigation and determines that, in at least one state of the world, there is the prospect of catastrophic climate change with non-negligible probability, then it makes sense to address that concern without *any* attention at all to 'free-rider' strategic policy complications or even such controversial issues as choice of discount rate (Clarke and Reed, 2006). In short, unilateralism makes sense. There are compelling arguments that the world is indeed faced with the prospects of catastrophic climate change with non-negligible probability. In widely-cited work, Weitzman (2009) has estimated a 5 per cent chance of warming of 10°C over the next 200 years if countries only gradually ramp-up their responses to warming. With a 1 per cent probability there will be 20°C warming. These would be catastrophic events for all nations and the probabilities are definitely non-negligible again implying a rational case for unilateralism.

Thus the argument that individually rational countries might 'opt out' of a mutually advantageous global deal on climate control for reasons of perverse incentives is not unambiguous. There is a case for unilateralism among large countries even putting to one side the issue of compensations. With the compensations that *should* be paid on the practical basis that this secures a mutually advantageous global deal this case becomes even stronger. In short, global environmental agreements with respect to climate change should be strategically straightforward if countries accurately perceive the costs and benefits of active policy.

**3. Integrating environmental objectives into trade agreements.** I concentrate discussion on the case for using border tax adjustments (BTAs) as an auxiliary policy to national climate change mitigation policies. These policies are of particular interest because, provided BTAs are levied as consumption taxes, they seem to be both consistent with the rules of the GATT (Taniotti et al., 2009) and the objective of eliminating many carbon leakage issues.

If carbon charges are computed on a consumption basis then exports of carbon-intensive goods would be exempt from charging but imports of carbon-intensive goods would be subject to a BTA. This arrangement eliminates carbon leakages associated with unfair competition from imports not subject to carbon charges and leaves exports competitive with foreign-produced goods in destination markets where charging does not occur. It also eliminates foreign capital flows that are purely based on seeking 'pollution havens' free

from the impact of carbon charging. The only leakage issue not resolved by this choice of tax base is that due to the induced fall in the global prices of carbon-based fuels that will result from carbon-charging and hence reduced carbon-based fuel use in mitigating countries. These reduced prices provide non-mitigating countries with incentives to increase their carbon-based energy use and hence their carbon emissions.

Taxing carbon emissions on a consumption basis is a useful 'second-best' prelude to the 'first-best' policy which should involve uniform production-based carbon taxes. Indeed countries which are net exporters of carbon have incentives to switch from consumption-based to production-based charging to access the tax revenues that would otherwise accrue to destination economies. Countries which do not mitigate at all will not experience increased pressure to mitigate on a consumption basis as a consequence of consumption-based charging elsewhere since they will be subject to BTAs regardless. However, in its favor, such a tax base means that countries which do seek to mitigate intensively will not face real or perceived disincentives to do so on the basis of implied carbon leakages. In short, the case for unilaterally moving toward active mitigation strategies is enhanced.

Many developing countries have reacted strongly to the proposed use of BTAs. What is the rational basis for this objection? On economic efficiency grounds no non-mitigating country has any reasonable basis for opposing *correctly imposed* BTAs as an unjustified restriction on world trade provided such charges only internalize the external costs associated with consumption in a nation. This means that the core issue is the possible *misuse* of BTAs by using them illegitimately as a basis for a revival of protectionism.

There are several reasons for fearing BTAs might be misused. A major difficulty is the computation of the appropriate BTA when an exporting country applies non-price-based measures to control carbon emissions. Countries might prefer publicly-supported, renewable technologies, investments in improved energy efficiency or direct controls on emissions rather than carbon charges. This only means however that the compensations negotiated cannot take the form of additional GGE entitlements but must be taken as alternative income or technology transfer benefits.

Even if however countries did apply uniform carbon charges and exemption policies there remains the core issue of computing BTAs when imports are produced using distinctive technologies particularly when complex manufactures are imported with components imported from a range of countries. There are ambiguities in these areas that private interest groups will seek to exploit to advance individually rational though ultimately destructive protectionist agenda.

These complexities disappear if the *threat* of introducing BTAs is enough to drive an international agreement that comes close to attacking carbon emissions on a production

basis. This is presumably the intent of the Waxman-Markey Bill<sup>2</sup> – as least in the form it was passed by the US House of Representatives – since it does not propose imposing BTAs until at least 2020 and then only on imports from countries which are not *very* poor and which do not mitigate to an extent comparable with stated US intentions under this Bill.

A particular practical focus is on the policies that should be adopted to derive trade strategies that reflect embodied carbon content. The issue is ‘carbon’ not ‘energy’ content since greenhouse externalities do not arise with non-carbon-based power technologies.

With a mix of trading countries that are thinking of mitigation and those who will not production-based carbon charges will, as argued in the previous section, induce carbon leakages thereby reducing the unilateral incentive to mitigate. Consumption-based charging will prevent most of these leakage effects from developing hence providing additional impulse to unilaterally mitigate.

Non-mitigating countries will enjoy extra consumption benefits if other countries do not levy charges on their carbon-based exports. Such non-mitigators will not face extra incentives to mitigate on a consumption basis since BTAs will apply to their own exports regardless. They do face possible incentives to mitigate on a production basis to regain revenue that would otherwise accrue to mitigating destination countries for their own exports. Whether these incentives will be strong enough depends on the foregone energy consumption benefits they forego with such charging.

**4. Final remarks.** The key issue confronting all nations is that GGEs must be cut. Developing nations such as China have low per capita energy consumption levels compared to the US but high aggregate GGEs. They are also among the countries most likely to experience severe costs of unmitigated climate change because of the substantial dependence of their economies on agriculture and looming water supply issues that climate change will aggravate. China is being dragged in two directions – it has a strong unilateral impulse to mitigate that is tempered by its development objectives.

The best initial basis for dealing with climate change is via a tax on a consumption basis with compensations sought from the developing countries in terms of financial aid, finance or generous initial carbon emission quotas. Ultimately the world is best off with a uniform carbon price regime administered on a production basis. An initial step is to tax on a consumption basis to help motivate a strong mitigation response by developed countries.

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<sup>2</sup> More accurately, this is the *American Clean Energy and Security Act of 2009* passed by the US House of Representatives on June 26, 2009. It seeks to trim US GGEs by 17 percent over 2005 levels by 2020 and by 80 per cent by 2050, using a ‘cap-and-trade’ scheme. The Bill remains to be approved by the US Senate and is subject to possible amendment there.

## References

H. Clarke, Carbon Leakages, 'Free Riders and International Climate Change Agreements', *mimeographed*, 2009.

H. Clarke & W. Reed 'Consumption/Pollution Tradeoffs in an Environment Vulnerable to Pollution-Related Catastrophic Collapse' in M. Hoel (ed) *Recent Developments in Environmental Economics, Critical Writings in Economics*, Elgar Reference, 2006, 497-516.

L. Taniotti, A. Olhoff, R. Teh, B. Simmons, V. Kulacoglu & H. Abaza, *Trade and Climate Change: A Report by the United Nations Environment Programme and the World Trade Organisation*, UN and WTO, Switzerland, 2009. ([here](#)).

M. Weitzman, 'On Modeling and Interpreting the Economics of Catastrophic Climate Change', *Review of Economics and Statistics*, XCI, February, 2009, 1-19.

World Bank, *Costs of Pollution in China, Economic Estimates of Physical Damages*, World Bank Office, Beijing, 2007. ([here](#)).