

Theory and Applications

Introduction to the Special Issue

Trade and environment: local versus multilateral reforms

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[We] must ensure that ordinary citizens in all countries actually benefit from trade—a trade that . . . protects the environment.

President William J. Clinton
State of the Union Address, 19 January 1999

1. Introduction

The hullabaloo that was the World Trade Organization's millenium meeting in Seattle has shown us that ordinary people have serious misgivings about the multilateral trading regime—both the rules and the process. Future progress in trade liberalization will depend on convincing the wider public that trade agreements are good for the environment and good for development (including labour and human rights), not just GDP. This is more than a public relations challenge. The concerns voiced by the Seattle protesters—some of them, anyway—raise profound intellectual questions.

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Though discussions about trade and the environment are often polarized, these issues are amenable to analysis; and it turns out that the economics of trade and environment are more complex and subtle than the extremists on either side of the debate either comprehend or are willing to concede. As the papers in this special issue show, we cannot be sure that trade liberalization on its own will be beneficial to the environment or even welfare. However, in many cases it will be, or can be made to be by combining trade reform with improved environmental policies. Still, incremental changes in the trading rules must be carefully chosen. Some proposals for reform are likely to harm welfare and may not even help the environment.

The papers published here cover important ground, but they comprise only pieces of a bigger puzzle. My aim in this introduction is to place these papers in this bigger frame. I want also to place them in the context of the agenda for WTO reform.

2. Preliminaries

Is a move toward more liberalized trade good or bad for the environment? This is a simple question for which there is no simple answer. One country's environment might be improved by an easing of trade restrictions while another country's environment is damaged. Indeed, an aggregation of environmental quality across all countries may show an increase or a decrease. In general, a move toward more liberalized trade is neither good nor bad for the environment (and why should we expect that it would be, given that the *aim* of liberalization is not to protect the environment?). The effect of liberalization will depend on many things: the technologies and endowments of the trading countries, the nature of the original trade distortions, and the nature of the liberalization program—in particular, whether environmental policy adjusts to the changing trade regime.

To see this, it is best to decompose the effects of liberalization on the environment.¹ The most obvious effect is an increase in the scale of economic activity—the scale effect. Of course, higher output, all else equal, means higher pollution emissions. However, all else will not be equal.

Liberalization increases aggregate output by causing production to be redistributed, with countries exporting goods for which they have a comparative advantage. Put differently, trade liberalization leads to a more efficient allocation of resources. This reallocation of production—called the composition effect—could either exacerbate or dampen the scale effect. If liberalization causes dirty industries to expand in countries with tougher pollution control laws—and thus to contract in countries with weaker environmental standards—the emission content of output will fall. If it falls by enough, trade liberalization will improve the environment. However, it is also possible that the composition effect could magnify the scale effect. The combined effect is an empirical question.

In a study of the consequences of trade liberalization between Mexico and the United States, Grossman and Krueger (1993) found both positive and negative effects. The scale effect would increase emissions but the composition effect would cause labor-intensive industry to expand in

¹ I am drawing here from Grossman and Krueger's (1993) framework.

Mexico and capital-intensive industry to grow in the United States. Labor-intensive industries are cleaner. Hence the composition effect would reduce the share of dirty industry in Mexico's economy, and increase its share in the US. Because regulations are generally tighter in the United States, Grossman and Krueger argue that total emissions might actually fall as a consequence of the liberalization.²

Trade liberalization might also reduce emissions per unit of output (holding constant both the level and the composition of output), the so-called technique effect. Pollution control is about more than adding a filter to the end of a pipe. Control often becomes embodied in the process technology—to the point where it becomes difficult to separate the manufacturing process from the means of reducing emissions. As a consequence, the trade mechanism, and especially foreign investment, may cause cleaner technologies to be used in developing countries—more so than would be required to meet local environmental standards.

Jagdish Bhagwati, in this issue's Policy Forum, suggests that this effect could be further exploited by making it obligatory for multinationals setting up operations in developing countries to employ the same technologies as would be required to meet tighter standards in their home countries (Bhagwati, 2000). His endorsement is partly practical—the distortions introduced by such a code of conduct would probably be minimal, and some firms have adopted such a code on their own already. However, as Richard Cooper notes in his commentary, there is a downside to the proposal: it essentially prevents developing countries from exploiting a potential source of comparative advantage, at least as regards foreign investment (Cooper, 2000). Note, however, that Cooper's criticism carries less force if environmental standards in developing countries are farther from the optimum commended by a local cost-benefit rule than the standards forcibly imported from abroad—a point I shall return to later.

The effect of liberalization on emissions per unit of output (again, holding fixed both the scale and composition effects) will also depend on environmental policies. Countries that impose, and enforce, environmental quality standards, for example, automatically limit the damage associated with the scale and composition effects. There may be an increase in emissions in areas where these standards do not bind, but this increase will presumably cause little harm. If not, then tighter environmental quality standards should have been imposed in these areas in the first place.

More importantly, environmental policies should adjust as we shift to a new trading regime. The increase in incomes associated with trade liberalization will increase the marginal willingness to pay for a cleaner environment—assuming that environmental quality is a normal good—and so require a tighter pollution standard.

Suppose that environmental policies did adjust optimally. What then would be the full effect of trade liberalization on the environment? In

² In section 3 of Copeland (2000), the technique effect (by assumption) exactly offsets the scale effect, but the composition effect increases pollution in poor countries and decreases pollution in rich countries.

general, we cannot say. However, this is the wrong question to ask. More important is the effect of liberalization on welfare. If our environmental policies are optimal and adjust optimally to the new economic regime, free trade will be best.

Of course, the increase in welfare associated with the liberalization might be achieved at the expense (optimally) of a worsened environment. However, for the moment, leave this trade-off to one side and look at this problem from a different perspective. Suppose that trade liberalization increases both incomes and pollution levels (whether optimally or not). If we cared only about pollution, and not at all about income, should we reject the liberalization program? The answer is 'no'. For we could take the increase in income associated with liberalization, spend it on pollution control, and ensure that environmental quality improved across-the-board, relative to the *status quo*. The reason is that restrictions on growth are a very blunt instrument for environmental protection. Better environmental policies could achieve the same environmental improvements at much lower cost—or greater improvements for the same cost. That is, taking our current environmental policies (which may or may not be optimal) as given, and starting from a world in which trade is restricted, trade liberalization can be used as a vehicle for reducing pollution levels without imposing any additional net costs.

This reasoning suggests that pro-environment protestors should plead for stronger, better environmental policies—that is, a superior technique effect—not for increased protectionism. Put differently, they should protest about a country's environmental goals, and the manner in which these are achieved, not the multilateral trading rules.

3. Second-best considerations

Though this point might be accepted in theory, protestors will surely complain that it cannot be relied upon in practice. Here, they may have a point. Re-framing this concern, we can ask: If environmental policies do not adjust optimally, can we be sure that trade liberalization will improve welfare?

Jinhua Zhao's answer is 'no' (Zhao, 2000). He shows, in a model in which property rights to an environmental resource are 'loose' (that is, somewhere between 'open access' and the 'sole owner' regime), correction of a trade distortion may lower welfare if the correction is unaccompanied by an improvement in the property rights regime. This result is to be expected by anyone familiar with the theory of second best as applied to trade policy (see Chichilnisky, 1994). However, Zhao also shows that a small reduction in the trade distortion may improve welfare even if the environmental resource is poorly managed. Zhao thus rejects the claim that trade reform should be embraced with or without environmental reform. But he also rejects the counter-argument that trade reform should be accepted only if accompanied by environmental reform.

Hence, while we should in general commend coordination of trade and environment reforms, if this is not possible, we should not reject trade reforms outright. Whether trade reforms will lift welfare in the absence of environmental policy reforms is an empirical question.

This is why Ramón López's contribution is so important (López, 2000). López constructs a general equilibrium model to analyze the impact of trade reform on both welfare and the environment. Applying the model to Côte d'Ivoire, López finds that institutional failures promote excessive use of the environment—defined in his paper as the stock of natural vegetation, a grazing resource that also protects the soil and controls flooding. The inference is that management of this resource more closely resembles open access than sole ownership. López finds that complete trade liberalization would actually improve on this management regime by inducing a shift in agriculture toward land-conserving crops. However, López also finds that if only protection to the non-agricultural sector is reduced, the biomass will be degraded further—and welfare will fall. Lesson: the precise nature of the liberalization program matters.

Brian Copeland shows that there is another dimension to this problem (Copeland, 2000). If trade reforms made it impossible for countries to use trade policy for domestic protection, environmental policy may become a second-best instrument for strategy. In effect, trade reforms may simply shift protectionism to other policies, environmental policy included. Trade liberalization may cause importers of pollution-intensive goods to weaken their environmental standards, and exporters of pollution-intensive goods to raise their environmental standards, both interventions tilting the terms of trade in the direction of the home government. To sustain a first-best outcome, both of the government's visible hands must be tied by international agreement—the hand of trade policy *and* the hand of environmental policy. From this perspective also, coordination of trade and environmental policies would seem desirable.

4. Multilateral policy reforms

What does coordination mean? If information were both complete and perfect, it would be a simple matter to calculate the optimal environmental standard for every country and to monitor implementation. The 'right' standards could then be negotiated alongside the free trade rules. However, in the real world the information needed to do this will not be available. The ideal of free trade means zero trade restrictions. The ideal of an optimal environmental standard does not mean zero pollution. So how would you know whether a country has set the 'right' standard or whether it has neglected its environment or perhaps manipulated its environmental policy for strategic purposes? The simple answer is: there is no easy way to tell. This, I think, is what makes harmonization compelling to its proponents. At least, from the perspective of some members of the US Congress, another country's standard is 'right' if it is the same as the US standard. If another country's standard is lower, or so some members of the Congress have argued, then producers in this country have an 'unfair' advantage and the US should be allowed to countervail against imports from this country. This is not permitted by the WTO rules, which is one reason why reformers would like to see them changed.

Of course, harmonization is not recommended by economic theory—and to this extent at least the existing rules have some merit. But the coordination supposed by the theory may not even be feasible, given the

information problems that abound. Reforms that allow for imperfect coordination could easily lower welfare (though whether they will is another empirical question).

A related question is: harmonization of what? There is not one kind of environmental standard but three—product standards, emission standards, and environmental quality standards—and harmonization of each of these has different implications. The European Union's program of harmonization referred to by Copeland largely concerns product and environmental quality standards, and I shall begin by discussing these.

Harmonization of product standards may be justified for a number of reasons. It can remove incentives to use product standards as disguised trade barriers (a 'loophole' in Copeland's terminology). It can create a single market, and thus allow firms to exploit more fully potential economies of scale. And, where network externalities are strong, harmonization can help ensure that countries do not get locked into the 'wrong' standard, as in the famous QWERTY parable.³ To be sure, harmonization of product standards also entails costs—there will be a loss in diversity and it is not obvious that harmonization imposed by governments can improve on the market-led harmonization common to systems markets. However, leaving this issue to one side, the WTO already allows complete freedom in the setting of product standards (all the EU states are WTO members!), provided they are non-discriminatory. For example, a country can ban the sale of the pesticide DDT domestically without triggering a trade dispute. A dispute would only arise if the ban applied to imports but not domestic production. If it is harmonization of product standards that protestors desire, there is no need for WTO reform, only the negotiation of WTO-compatible side agreements.

Environmental quality standards for both the air and water are typically harmonized within individual countries. As mentioned earlier, they are also harmonized within the EU. The reason for this harmonization is unclear. If preferences vary, and if the harmonization constraint bites, some regions of a country will be forced to reduce pollution by more than would be justified by local circumstances. This would be bad for the local economy. Harmonization might improve matters all round if the standards helped to limit cross-border pollution flows. However, they are as

³ With network externalities, as more countries adopt a product standard, it becomes more attractive for other countries to adopt the same standard. An example is the standard for auto emissions. The US standard requires the use of catalytic converts. To supply the US market, European car manufacturers had to adopt the same technology. This made it cheaper for Europe to adopt the US standard at home rather than an alternative standard that would have promoted the development of an alternative technology, such as the lean burn engine. Moreover, catalytic technology requires the use of unleaded gasoline, and as more countries adopt this technology, it becomes more attractive for neighboring countries to supply unleaded gasoline, which in turn makes it more appealing for these countries to adopt the catalytic standard. Note, however, that there can be no presumption that this outcome is efficient. It is possible that every country would be better off with an alternative standard. This is the lesson of QWERTY; see David (1985).

likely to have the opposite effect (for example, local concentrations of sulfur dioxide can be reduced by building taller stacks, but doing so increases pollution exports). The most plausible justification for this kind of harmonization is to prevent a 'race to the bottom'. However, as discussed by both Bhagwati (2000) and Copeland (2000), economic theory suggests that the circumstances that would justify the setting of the 'weak' standards are very limited.⁴ Moreover, there is little empirical evidence to suggest that 'weak' standards improve 'competitiveness'.⁵

It is as well to note that the US and EU did not choose their uniform environmental quality standards by applying a cost-benefit rule. Indeed, US legislation explicitly prohibits setting air quality standards with any regard for costs. In other words, it is not obvious that the environmental quality standards in industrialized countries are optimal even from the perspective of these economies let alone from the perspective of developing countries. Why should developing countries be required to adopt these standards? A related point is that the US and EU standards are often violated. Is it enough for a country simply to establish the same standards, or would compliance need to be monitored? And if a country were shown to have violated the harmonized standards, should it be punished—and, if so, how?

Harmonization of emission standards raises additional issues, one being that emission standards are rarely harmonized even within countries. For example, while minimum air quality standards are determined nationally within the US, individual states have primary responsibility for ensuring that these are met. Similarly, with very few exceptions, member states of the EU can decide for themselves how the common EU environmental quality standards are to be met—an example of the principle of subsidiary at work. Economics would of course approve of this practice. Emission standards should be set with a consideration of both marginal abatement costs and marginal abatement benefits, relations that are plant and location specific. Of course, our emission standards are determined by a political system, not by our best textbooks, and though harmonization of emission standards will almost certainly fail the optimality test, our existing, non-harmonized standards may also fall short of being optimal.⁶ However, my main point is that it would be inconsistent to require harmonization between countries without also requiring harmonization within countries, and with few exceptions we have already chosen—almost certainly for good reason—not to harmonize emission standards domestically.⁷

To sum up, although theory tells us that trade liberalization should be

⁴ By a 'weak' standard I mean a standard that is weaker than would be justified by the usual comparison of marginal environmental damages and marginal abatement costs. See Barrett (1994) for further support of this view.

⁵ See also Jaffe *et al.* (1995) and Levinson (1996).

⁶ Cooper (2000) makes a similar observation. For an economic analysis of standard setting by regulatory agencies in the US, see Magat, Krupnick, and Harrington (1986). For a sociological study of standard setting in the UK, see Hawkins (1984).

⁷ See Ulph (2000) for an analysis showing that harmonization can rarely be justified, even when states have incentives to carry out 'environmental dumping'.

accompanied by coordination of environmental policies, the reforms that are often proposed bear little resemblance to the type economists have in mind. We need to evaluate very carefully whether the reforms being proposed really will improve welfare.

5. Democratization

Jagdish Bhagwati's paper in the Policy Forum hints at a reform that would be likely to help (Bhagwati, 2000). This is a reform in domestic political institutions, not the WTO. Bhagwati argues that democratically elected governments would not manipulate their environmental policies for strategic purposes. I am not convinced that this can be utterly relied upon. After all, the literature shows that there are situations in which it may be in a state's interests to behave strategically, even ignoring political-economy considerations. However, it is certainly possible if not likely that more democratic countries tend to set standards that are closer to being optimal than less democratic countries.⁸

This hypothesis would be difficult to test directly, but Kathryn Graddy and I show that certain measures of environmental quality (the measures linked directly to public health) are systematically higher in countries with greater civil and political freedoms, income differences aside (Barrett and Graddy, 2000). This has two implications. If trade liberalization cannot be sure of raising welfare in developing countries because of inappropriate, local environmental policies, it may be better to encourage local reforms in civil and political systems—reforms that would likely result in environmental improvements in these countries—than to block trade liberalization. Such reforms would improve environmental quality and in the bargain help ensure that trade liberalization actually raised welfare. If environmental standards are 'unfairly' low in developing countries—a claim for which, as stated previously, there exists little theoretical or empirical support—it may be better to promote the spread of freedoms in these countries than to impose countervailing duties or to harmonize standards internationally. The spread of freedoms would improve both the environment and welfare, something that countervailing duties and harmonized standards could not be sure of doing. Indeed, this recommendation may well be the best way of attaining the kind of Appropriate Governance advocated by Bhagwati (2000).

6. Trans-boundary environmental protection

I have so far discussed only local environmental problems. Transboundary issues raise different problems—and may require different solutions.

Copeland (2000) shows that countries have incentives to link negotiations over trade and transboundary pollution. The strategic interactions are especially important. With free trade, countries with a comparative advantage in pollution-intensive goods will pollute more—giving them an advantage in the environmental bargaining game. These countries will be keen to negotiate a trade agreement before an environmental agreement.

⁸ This is suggested by Olson's (1993) analysis.

Importers of pollution-intensive goods would have precisely the opposite incentive.

Kym Anderson and Warwick J. McKibbin note another feature of linkage (Anderson and McKibbin, 2000). This is that, as parties to an international agreement reduce their emissions of greenhouse gases, production in carbon-intensive sectors is likely to relocate to non-parties, reducing the environmental benefit of the abatement by parties—a phenomenon known as ‘trade leakage’.

A related problem is enforcement of an international environmental agreement. An effective international agreement must deter non-participation. In the most successful example of international cooperation yet—the Montreal Protocol on Substances that Deplete the Ozone Layer—non-participation was deterred by a trade restriction. In this particular case, the threat of trade sanctions has been sufficient to deter non-participation—and it has eliminated trade leakage in the bargain. Paradoxically, it is likely that worries about leakage helped make the threat credible (Barrett, 1999a).

Unfortunately, the circumstances that made the Montreal Protocol successful are special (see Barrett, 1999b). It is likely that the mere threat of imposing sanctions would not be sufficient to enforce a climate change agreement, and it is interesting to note that the Kyoto Protocol does not make any allowance for trade sanctions. This is likely to spell problems for Kyoto. However, had the agreement included trade sanctions—or were it to do so in a future amendment—then the multilateral trading system might itself be threatened.

As things now stand, the Kyoto Protocol may not even enter into force—perhaps partly because of the problems noted above. Is there any alternative? Anderson and McKibbin (2000) show that sectoral reforms—in particular, the removal of subsidies to the coal industry—could make a substantial difference. Indeed, and in contrast to most predictions of the effects of Kyoto, the coal policy reforms advocated by Anderson and McKibbin would not only lower global emissions but also result in income gains. At the same time, such reforms are only a step in the direction of achieving the aim of the climate change regime: to prevent ‘dangerous anthropogenic interference with the climate system’.

7. Conclusion

This special issue provides some evidence that trade reforms can be good for the environment. However, the papers presented here also show that this cannot be relied upon. In general, trade policy reforms need to be accompanied by a strengthening in environmental policies.

There are really two different approaches that might be taken as regards local environmental problems. One is to link environmental policies to trade policies within the WTO. This might be called the ‘think locally, act multilaterally’ strategy. The other approach is to promote better environmental policies by individual states—the ‘think multilaterally, act locally’ strategy. There is some theoretical support for the former approach, but it is not obvious that the linkages that might actually be made really will be beneficial. In my view, there is greater merit in the latter approach. If the justification for linkage is that environmental policies in developing coun-

tries are 'wrong', then the aim should be to improve these policies. Playing with the trading rules might be a means for doing this, but it would arguably be better to promote improvements in environmental policies from within, by strengthening the civil and political institutions that determine, monitor, and enforce local environmental standards, than to impose change from the outside.

Trade liberalization and protection of the shared environment are both important goals, and they are often linked automatically. In general, neither goal should take priority. However, there may exist circumstances in which having more of one means having less of the other. For these cases, rules may be needed for determining when trade restrictions should be permitted and how they should be structured.⁹ According to the WTO's Committee on Trade and Environment, 'multilateral solutions based on international cooperation and consensus [are] the best and most effective [means] for governments to tackle environmental problems of a trans-boundary or global nature'.¹⁰ This might be called the 'think multilaterally, act multilaterally' strategy. It is a commendable approach, but one that may need to be backed up by rules based on generally accepted principles, not measures decided piece-meal and possibly by a subset of countries.

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⁹ One such rule should be that restrictions should be applied 'fairly'; see Bhagwati and Srinivasan (1996) and Barrett (1999a, b). The Montreal Protocol compensates developing countries for participating in the agreement, so that the stock of sanctions essentially applies only to free riders. Sanctions may be mainly responsible for deterring non-participation, as Benedick (1998) has argued, but the carrot of side payments has helped to make their use legitimate.

¹⁰ See the report of the WTO's Appellate Body, AB-1998-4, 'United States — Import Prohibition of Certain Shrimp and Shrimp Products', WT/DS58/AB/R, 12 October 1998, p. 68.

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