

CONTINENTAL TRADE AND ENVIRONMENTAL POLICY

Ian Wooton

The Uni. of Western Ontario

I. INTRODUCTION

In this paper we examine the relationship between international trade and environmental policies in the context of a regional trading agreement, with special reference to the North American Free Trade Agreement (NAFTA). Our interest was sparked by the renowned trade conflict on tuna between Mexico and the United States in which the Us used trade policy (an embargo on imports of tuna) in order to pursue an environmental goal (the protection of dolphins, that are frequently caught and die in the nets of Mexican tuna fishermen). This bilateral dispute highlighted some of the inadequacies of the current multilateral trading system in dealing with environmental problems; indicating that, in the absence of a significant change in the General Agreement on Tariffs and Trade (GATT), some other mechanism is needed in order to resolve disagreements over environmental issues.

Two additional elements of the tuna dispute were of particular interest to U.S. in relation to regional trading agreements such as the NAFTA. The first of these is the observation that countries at different

stages of development seem to have different degrees of concern as to the harmful environmental consequences of their productive activities, while the second is the use of international trade policy as a means of controlling environmental problems.

There are many explanations for the relative laxness of pollution standards in developing countries, one of the more common being that a clean environment is a luxury good that the poor nations can ill afford. Whatever the reason, casual empiricism indicates that similar industries are "dirtier" in developing countries than in the industrialized world. This raises an interesting question in terms of economic integration in North America. While the initial agreement between Canada and the U.S. was one between rich countries at similar stages of development (which has also been largely the case for European integration) the proposed NAFTA involves the creation of a free-trade area encompassing rich and poor nations. Regional trading agreements composed of fairly homogeneous countries most likely generate few environmental problems, in that the participating countries will have been pursuing similar pollution policies independently. Indeed, integration may permit the members to harmonize their environmental policies to a greater degree than previously possible. But if the member countries have markedly different incomes, as have the U.S. and Mexico, their tolerances for pollution may widely differ. Consequently the increased volume of trade that will result from the NAFTA may then be accompanied by deleterious effects on the environment as a direct consequence of the deal. The prospect of this led to vigorous campaigning by environmental groups in the U.S. and Canada against the NAFTA, or at least in favour of a parallel accord on environmental issues. The Clinton Administration successfully negotiated a side agreement on the environment (as well as one on labour issues)

without which, it was argued, the NAFTA could not have received congressional approval.¹⁾ Immediately following the signing of the environmental side agreement, several of the major envi

ronmental lobbying groups endorsed the NAFTA as being beneficial to the environment. This side agreement may have allayed fears of pollution sufficiently to ensure NAFTA's passage through Congress.

Dealing with pollution that occurs outwith a country's frontiers is generally difficult, if not impossible. Clearly, the country does not have the jurisdiction to impose controls on activities taking place in another nation. However, should some of the products made by the polluting industries be sold on international markets, then foreign countries may be able to use trade policy as a means of limiting the environmental damage. Thus, a country could impose restrictions on the environmental characteristics of goods sold on its markets, even if these goods are manufactured abroad. Consequently, the country would be subjecting imported goods to its domestic laws. The more important is an importing country's market to the polluting industry, the more effective its trade policy will be. Thus the U.S. was able to control the destruction of dolphins by its embargo on canned tuna that was caught by methods that endangered the mammals, using a trade restriction to ensure that all tuna on the American market was "dolphin free". Free trade in North America will prevent countries from exercising such (indirect) controls on foreign pollution, but the increased cooperation between countries inherent in regional integration opens up the possibility of finding ways to resolve this

1) ~These agreements are entitled the "North American Agreement on Environmental Cooperation" (hereafter termed the "side agreement") and the "North American Agreement on Labour Cooperation" [Government of Canada (1993a and 1993b, respectively)], signed on 14 September 1993.

problem of *extrajurisdictionality*, the application of domestic laws to activities occurring outside one's country.²⁾

Because of this interaction between trade and environmental policies, the goal of our research has been to illustrate the importance of enacting *parallel* rather than *sequential* agreements on the two issues in North America. We have taken up this task in a series of analytic papers [Ludema and Wooton (1992 and 1993)]. These are theoretical explorations of the relationship between international trade and environmental policies. As far as we are aware, the questions that we raise have not been previously addressed in the international trade literature. The current paper presents a more policy-oriented analysis of the implications of North American regional integration for the environmental well-being of the continent, examining the instruments and options available to control pollution while markets are being opened up to continental competition.

In Section II we separate out those environmental problems of especial relevance to regional integration. The inability of importing countries to impose environmental controls on foreign goods leads us to consider the potential use of trade restrictions as environmental controls in Section III. We discuss the constraints on such unilateral action arising from membership of the GATT and briefly consider how the articles of the GATT might have been amended in the Uruguay Round in order to permit trade restrictions for environmental purposes. In Section IV we examine cooperative, comprehensive agreements on trade and environmental issues. The goal of such agreements is to balance the goals of more open international markets with effective environmental management; but national ambitions may pervert the

2) See Charnovitz (1992) for the distinction between "extraterritorial" and "extrajurisdictional."

outcome. We then look at the NAFTA and its environments side agreement to determine whether the goal has been accomplished. Section V considers how the Multilateral Trade Organization, MTO, the successor to CATT and a forum purely for the establishment of trade policy, might yet serve a role in influencing multilateral environmental policies.

II. THE ENVIRONMENTAL PROBLEMS BEING ADDRESSED

Part of the difficulty in navigating through the ocean of literature on international trade and environmental economics is that there are several types of environmental problems, each of which demands a different type of remedy. Only in certain instances will that remedy involve changes in trade policy.

At one end of the spectrum are, what we shall call, *local* pollution problems. These involve the degradation of the environment in the immediate vicinity of the consumption or production activity, affecting only the local community and having no spillovers to other countries. This environmental damage may range from the purely aesthetic (for example, the construction of a spectacularly ugly factory building or shopping mall) to life-threatening (the contamination of local ground water). The crucial aspect of this category is that this pollution does not have any international consequences: neither does the pollution itself have an impact on citizens of other countries; nor does the use of dirty production processes confer a competitive advantage to producers with respect to foreign firms. The environmental problems are caused by and affect only the local population and consequently the solutions are purely local, with no role for any international policy.

In complete contrast are problems of the *global commons* type, in which the actions of every country have a direct impact on all nations. The emissions of greenhouse gases and the atmospheric release of CFCS clearly fall into this category. Such problems require global solutions, cooperative agreements such as the Montreal Protocol. While international trade policy might be used in order to reward participation in such an agreement, and punish non- performance, there need be no direct link between the cause of the pollution and the volume of international trade.

Between these categories lies the type of problem with which we are concerned and which, we believe, is of especial importance to questions of regional integration. In this case, the pollution arises in the manufacture of goods, a significant proportion of which are for export. The pollution may directly affect citizens in the importing country (for example, the pollution of rivers on the border between the U.S. and Mexico) or it may be just that the knowledge of the environmental degradation lowers their welfare (as in the tuna/dolphin case).³⁾ In any event, there is a clear link between trade and the environment. Consequently, efforts at trade liberalization (as in regional integration) are likely to have implications for pollution levels in the region. We categorize these environmental problems as *cross-border externalities*. These environmental problems are more likely to occur between countries that are in close geographic proximity to one another, precisely the countries who have historically pursued preferential trade agreements (for example, NAFTA and the EC in their respective eponymous continents). Thus, as our title indicates, our concern is primarily with *continental* trade and environmental issues.

3) Blackhurst and Subramanian (1992) call the former "physical" and the latter "psychological" spillovers.

II.1 Correcting for Environmental Externalities

An environmental externality involves a market failure, in the sense that the producer does not take into account the full costs of production of the good, as he is not required to pay for the emissions of pollutants arising from the production process. An effective way in which a government can affect the behaviour of its own firms is to tax the levels of pollution through an *externality tax*. This has the effect of raising the costs of "dirtier" producers more than those of relatively "cleaner" producers, while encouraging all firms to adopt less polluting techniques.⁴⁾ Such an externality tax embodies the *polluter pays principle*, PPP, where the creator of a negative externality is forced to pay for it.⁵⁾

When the good is traded, the importing country clearly cannot directly enforce the PPP. It must either reach an agreement with the exporting country that the latter implement an externality tax, or it could pay the foreign producers to use cleaner techniques (in which case, we have the *victim pays principle*, VPP, in operation), or it can unilaterally adopt some less direct policy that will, at least to some degree, control the foreign pollution. The first of these policies (and, perhaps, the second) might be part of a regional trade agreement. Attempts to use the last of these options may be seen to be at odds with a country's GATT obligations; as may be illustrated by the tuna/dolphin dispute between the U.S. and Mexico.

4) In contrast, a production tax will treat all producers equally and will only reduce the levels of goods production, not the method of production.

5) For more on this, see Blackhurst and Subramanian (1992).

Article I of the GATT establishes the principle of Most-Favored-Nation (MFN) treatment, whereby a country may not discriminate between "like" products imported from other contracting parties to the GATT. The characteristics of final products, and not the means by which they are made, determine whether or not they are alike. Thus, however tuna is caught, whether or not dolphins are killed in the process, has no bearing on the final product and therefore the U.S. was in violation of its GATT obligations in imposing the restriction on imports from Mexico. The U.S. argued that its application of the Marine Mammals Protection Act, 1972 was within the scope of Article XX (General Exceptions). The GATT panel on the tuna/dolphin case disagreed, rejecting this extrajurisdictional application of Articles xx(b) and xx(g), exemptions for "measures necessary to protect human, animal or plant life or health" and "measures relating to the conservation of exhaustible natural resources if such measures are to be made in conjunction with restrictions on domestic production and consumption," respectively.⁶⁾ Thus any measures that attempt to restrict trade based on arguments about environmental damage occurring in other countries are considered to be inconsistent with the GATT.

Countries that wish to influence other countries' environmental policies have two possible avenues within the GATT: they could attempt to build a consensus amongst the contracting parties such that the existing Article xx be *interpreted* differently and extrajurisdictional measures be considered acceptable; or they might seek a *change* in the GATT rules themselves. The latter objective,

6) Details of the findings of the GATT panel on the tuna/dolphin case are in Charnovitz (1992) while a general discussion of the relationship between the GATT and environmental objectives is in Arden-Clarke (1991).

the use of trade restrictions for environmental purposes, might be realised through the widening of Article vi to recognize externalized environmental costs as an inadmissible subsidy [Arden-Clarke (1991)]. In other words, a country that does not subject its producers to as stringent environmental standards as its trading partners would be deemed to be giving its firms an unfair subsidy. Unless the offending producers were forced to clean up, contracting parties to the GATT would be permitted to retaliate. Thus firms would be forced to internalize their pollution, allowing an international application of the PPP. However, such an amendment to the code on subsidies was not part of the Final Act of the GATT's Uruguay Round.

The Final Act of the Uruguay Round [GATT (1993)] does introduce a restriction on Technical Barriers to Trade (TBT) in which the least trade restrictive measures be imposed to achieve, among other things, environmental objectives. Thus, Article 2.2 states:

"Members shall ensure that technical regulations are not prepared, adopted or applied with a view to or with the effect of creating unnecessary obstacles to trade. For this purpose, technical regulations shall not be more trade-restrictive than necessary to fulfil a legitimate objective, taking account of the risks non-fulfilment would create. Such legitimate objectives are, *inter alia*, national security requirements; the prevention of deceptive practices; protection of human health or safety, animal plant life or health, or the environment. In assessing such risks, relevant elements of consideration are, *inter alia*, available scientific and technical information, related processing technology or intended end uses of products."

As we discuss, below, the least trade restrictive environmental measure may not be the most efficient instrument to achieve economic efficiency.

III. POLICY OPTIONS WITHOUT FULL COOPERATION

It is generally accepted that, in a very loose sense, more trade is better than less. International trade permits countries to specialize in the production of those goods in which they have comparative advantages, while their consumers have access to the full spectrum of goods on the international market. Consequently, the thrust of international trade negotiations over the past half century has been the tearing down of formal trade barriers, with the presumption that this will increase aggregate welfare. Of course, it has long been recognized that these gains will not benefit all countries equally (hence the need for negotiations) and that, in the presence of other market distortions, the gains may in fact not materialize and there may indeed be aggregate losses (the familiar second-best argument).

While the latter aspect is often given short shrift in policy circles, it may be particularly relevant when production externalities are present. Increased trade volumes may reflect increased production by polluting industries, and the consequential environmental damage may outweigh any trade gains.⁷⁾ In other words, trade liberalization may move the countries from one sub-optimal situation to another. Thus, if trade reform is to be a goal, it may have to be accompanied by policies to deal with pollution.

The remaining question is then, how can the best mixture of policies be arranged? Must there be an agreement for everything, or can

7) Of course, the reverse might also hold true: it may be that the new location of production uses cleaner techniques than those in the importing country (for example, if hydro-electricity were used instead of power from fossil fuels) and so, despite the higher production levels, the aggregate pollution might decline. For an assessment of the likelihood of this, see Grossman and Krueger (1991).

countries be allowed discretion over certain types of policies? Let us begin to answer these questions by examining the implications of discretion.

III.1. The Trouble with Tariffs

One approach to dealing with the problem of cross-border externalities is to restrict trade, through the use of tariffs or equivalent instruments. There are several problems with this approach. For one, if the country imposing the tariff accounts for only a small portion of the total demand for the polluting firms' product, the policy may be ineffective. The firms will just export to other countries without substantially reducing production. Consequently, the importing country has only a marginal effect on aggregate pollution levels, while having to substitute more expensive domestic goods for what it previously had imported. If several countries export the same good, but with different levels of the externality, the importing country's environmental policy may do nothing other than ensure that it gets the "cleaner" imports, while other importers that do not care to the same degree get the "dirty" goods.

The ability of governments to effectively control a cross-border externality through the use of trade policy depends on their having an ability to affect the prices received by firms; that is, the countries must be large. Only in these circumstances will firms change their behaviour in response to policies set in their export markets. Unfortunately, this is precisely the situation in which the importing country would wish to improve its terms of trade by restricting trade. Thus, allowing an importing country, large enough to affect world prices, to use tariffs freely for environmental purposes would most

likely lead to an over-restriction of trade. It should also be borne in mind that, if the exporting country is similarly empowered, it might wish to tax its exports for the same reason. Worse yet, the protectionist intent of these policies will be obscured behind a veil of environmentalist rhetoric.

Another drawback to using a tariff for environmental purposes is that it is too blunt a policy instrument. If there is technology available to the polluting firms that can control the amount of pollution created in the production process, then taxing the production of the good would not induce the firms to adopt this technology. The first-best policy in this instance is a tax applied directly to the pollution itself, for this would induce firms to economize on pollution-generating activities. A tax on production is second-best and a trade tax, to the extent that it taxes only the traded portion of the firms' total production, would be worse.⁸⁾

For the remaining analytical discussions in this paper, we shall assume that there are only two countries in the world (in order to avoid the problems of substitution of dirty imports with clean imports from a third country) and, consequently, that these countries are both large (in the sense of their both having monopoly power in trade). In order to consider the issues at their most extreme, we further assume that the government in the exporting country (reflecting the preferences of its citizens) does not care about the pollution that is created and hence only the importing country considers using environmental policies for the sake of controlling emissions. Any domestic production in the importing country is assumed to be already subject to the

8) If, however, the externality is produced in fixed proportions with output of the good (that is, there is no abatement technology), then a production tax would be equivalent to a pollution tax.

appropriate domestic pollution policies. We shall then modify these assumptions in the application of our results to the NAFTA nations.

III. 2. Free Trade with Discretionary Environmental Policies

Now consider environmental policies when these are being used in a *region*; that is, where the countries have a free-trade agreement, or are simultaneously introducing one. Given the (assumed) asymmetry between the partners in the region (with respect to their degrees of development, income, etc.), it is natural to ask why they should consider establishing a regional agreement. There are undoubtedly convincing political arguments that could be made for each specific region, but it is harder to find economic justifications for trade agreements between differently sized countries, as the smaller country will receive the lion's share of the benefits of trade liberalization.⁹⁾ It is conceivable that a regional trade agreement might be a *quid-pro-quo* incentive for pollution abatement. That is, small countries agree to clean up their production in return for access to the larger countries' markets.

The imposition of free trade between the two countries drastically diminishes, but does not deplete, the arsenal of instruments for conducting their trade war.¹⁰⁾ In particular, the exporting country still retains the possibility of setting an externality tax. Such a tax raises the private costs of production, both through inducing costly abatement

9) This is the standard optimal-tariff argument. A small country's welfare is maximized by multilateral free trade, while large countries benefit from trade restrictions that manipulate the terms of trade in their favour.

10) As a production tax acts in exactly the same way as trade taxes, we assume that it is also prohibited. In the absence of third countries, a free-trade agreement is the same as a customs union, or indeed multilateral trade liberalization.

methods and through the tax levied on the remaining pollution that is produced. As a result, industrial supply will shift back, reducing the equilibrium output and increasing the consumer price. Thus the exporter can improve its terms of trade, albeit imperfectly. The best instrument for this purpose, the export tax, is unavailable and so the externality tax is a second-best policy. Its inferiority to a trade restriction is precisely because it has induced the abatement expenditures, from which its citizens derive no benefit. However, the offsetting advantage to the exporting country of being part of the region is that the importing country is unable to retaliate, as the latter has negotiated away its right to use a tariff and has no means of restricting pollution levels. It is an empirical question whether the pollution tax is a good thing in this setting. The exporter is using it for his own selfish reasons but, in the process, the good is being produced in a less environmentally damaging way. So the possibility arises that both countries in the region may be better off from the use of the externality tax, despite the tax rate being set non-cooperatively.

While the free trade agreement may have stripped the importing country of its tariffs, an alternative policy instrument might be a *process standard*, a constraint on the means of manufacture, such that a good that is produced by clean techniques could be traded freely, while one whose production resulted in excessive pollution would face an embargo. While *product standards* abound, for varying health and safety reasons, they are not the same as process standards. Product standards are effective in controlling consumption externalities (for example, limiting the emissions by automobiles) and they are permissible under the GATT.¹¹⁾ However, they are controls on the final

11) The "Agreement on Technical Barriers to Trade" [CATT, (1993, II.6)] states that "no country should be prevented from taking measures necessary to ensure the

characteristics of a good, not on the means by which it was made. Thus a product standard could not force a manufacturer to change the methods by which a good is made, which is what is needed in order to limit production externalities. In order to differentiate between production technologies, a process standard that dictates or proscribes certain production techniques would have to be introduced.

Strictly speaking, as we pointed out in our discussion of the tuna/dolphin case, process standards violate Article I of the GATT, which insists that *like* goods must be treated identically. Yet several European countries have discussed the introduction of process standards on imports, despite their contravention of the trade rules. The wisdom of the GATT code is that while a process standard can be an effective instrument for environmental policy, it could equally be a powerfully protectionist instrument. If the process standard is set at a high level, in the sense that a substantial amount of pollution is permitted in production, then the standard will restrict only the dirtiest of firms. As an environmental tool it is therefore quite effective, in clearing out the worst offenders, but would be fairly innocuous for trade policy. As the standard becomes more stringent, relatively cleaner production processes are caught and forced to clean up further, and the trade regime becomes more restrictive.

It is claimed by some advocates for the developing world that process standards that are established to reflect the production techniques of the industrialized world are biased against the developing countries, which are using more primitive (and, generally, dirtier) methods. Hence, it is argued that the appropriate standards that should be set

quality of [...] the environment [...] at the levels it considers appropriate, subject to the requirement that they are not applied in a manner which would constitute a disguised restriction on international trade [... 1."

for developing countries should reflect their levels of industrialization, particularly since the industrialized countries faced no such environmental impediments themselves during their development. Of course, the generous application of these differential process standards would limit their effectiveness.

Interestingly, the process standard, while protectionist enough on its own, also removes the primary drawback for the exporter of using an externality tax as a trade instrument. If the process standard is binding, then a marginal increase in the externality tax will not induce firms to further abate pollution. Effectively, the process standard turns the externality tax into a straight production tax or, if the externality tax is applied only to goods destined for export, into a export tax. This is contrary to intent of the free trade agreement and limits its effectiveness.

III.3. The Environmental Provisions of the NAFTA

When the NAFTA was negotiated, it was as a stand-alone, free-trade agreement with some references to environmental policies. It was only later that a side agreement on the environment (as well as one on labour standards) was added; all of which were implemented simultaneously. Thus, we shall first look at the environmental aspects of the original NAFTA treaty; that is the possible consequences of the implementation of this free-trade agreement had the partner countries been free to pursue independent (discretionary) environmental policies. We leave the discussion of the NAFTA *cum* environmental side agreement to Section IV, the analysis of comprehensive (trade and environmental) international cooperation. Table 1 provides a synopsis of the environmental provisions the NAFTA.

Table 1

Summary of the environmental provisions of the NAFTA

(a) The trade obligations of the NAFTA countries under specified international environmental agreements regarding endangered species, ozone-depleting substances and hazardous wastes will take precedence over NAFTA provisions, subject to a requirement to minimize inconsistency with the NAFTA. This ensures that the NAFTA will not diminish a country's right to take action under these environmental agreements.

(b) The Agreement affirms the right of each country to choose the level of protection of human, animal or plant life or health or of environmental protection that it considers appropriate.

(c) NAFTA also makes clear that each country may maintain and adopt standards and sanitary and phytosanitary measures, including those more stringent than international standards, to secure its chosen level of protection.

(d) The NAFTA countries will work jointly to enhance the protection of human, animal and plant life and health and the environment.

(e) The Agreement provides that no NAFTA country should lower its health, safety or environmental standards for the purpose of attracting investment.

(f) When a dispute regarding a country's standards raises factual issues concerning the environment, that country may choose to have the dispute submitted to NAFTA dispute settlement procedures rather than under the procedures of other trade agreements. This same option is available for disputes concerning trade measures under specified international environmental agreements.

(g) NAFTA dispute settlement panels may call on experts, to provide advice on factual questions related to the environment and other scientific matters.

(h) In dispute settlement, the complaining country bears the burden of proving that another NAFTA country's environmental or health measure is inconsistent with the NAFTA.

SOURCE: Government of Canada (1992)

A primary concern of our analysis in the preceding section was that the exporting country might attempt to exercise its monopoly power in trade by imposing externality taxes. Given the enormous differences in the sizes of the economies of the three parties in NAFTA, it is unlikely that the two smaller nations have a strong terms-of-trade influence for many commodities.¹²⁾ This will be especially the case for Mexico. So we shall ignore the scenario of Mexico applying higher environmental standards than it would otherwise impose just to raise international prices for its exports. In fact the concern expressed by labour groups in Canada and the U.S. was that Mexico might adopt lower environmental standards specifically so as to lure investment away from countries with strong pollution controls. Clause (e) of Table 1 reflects an attempt to address this concern and is embodied in the NAFTA treaty as Article 1114, part 2, stating that:

"(t)he Parties recognize that it is inappropriate to encourage investment by relaxing domestic health, safety or environmental measures. Accordingly, a Party should not waive or otherwise derogate from, or offer to waive or derogate from, such measures as an encouragement for the establishment, acquisition, expansion or retention in its territory of an investment of an investor. [...]"

Article 1114 is designed to prevent countries from providing production subsidies to firms, in that the pollution costs of their production would not have to be fully internalized.¹³⁾ Just how important

12) The Gross Domestic Products of the three countries were (in billions of U.S. Dollars at 1985 prices): Canada, 430; Mexico, 17; and the us, 4,645.

13) However there seem to be few teeth to the requirement. The article concludes with the statement that "(i)f a Party considers that another Party has offered such an encouragement, it may request consultations with the other Party and the two Parties shall consult with a view to avoiding any such encouragement." The side

differences in environmental laws are for firms' choices of investment locations is an unresolved question; opponents to the NAFTA placed a great deal of emphasis on this aspect of the deal, while some studies indicate that lax environmental standards account for only a small component of the industrial location decision [see Low and Yeats (1992)].

Our preceding analysis also indicated that the importing country might seek to use environmental policy in its imports both for the legitimate reason of limiting pollution but also as a means for it to exploit its monopoly power in trade. Given the dominant position held by the U.S. in Mexico's export markets, this latter purpose cannot easily be discounted.

A process standard is desirable to import-competing firms because, like a tariff, it raises the cost of imported products. So we should expect to see governments in a free-trade agreement, like NAFTA, being lobbied for process standards in much the same way they would otherwise be have been lobbied to impose tariffs.

From the standpoint of the welfare of the importing country, the process standard has the same desirable effect as the tariff of inducing pollution abatement in the exporting country, but has the disadvantage of generating no tax revenues. This shortcoming means that only a country that truly cares about the environment would impose a process standard on welfare grounds alone; a country that is not environmentally conscious would reduce its welfare through the use of a process standard, but might still use one if it succumbed to political pressure from its import-competing industry.

agreement on the environment charges the Council of the newly formed Commission for Environmental Cooperation to provide assistance to the Parties in consultations under Article 1114.

In terms of world welfare, a drawback of the process standard is that it does not lead firms to internalize the social costs of their pollution sufficiently, unless the process standard is augmented with a production tax of some sort. To see this, compare a process standard with the optimal pollution tax. Under the pollution tax, firms pay not only a production cost per unit of output, due to the expensive pollution-abatement technology they have been forced to adopt, but they also pay a tax levy on whatever pollution they *do not* abate. Under a process standard, the firms pay the costs of pollution abatement, sufficient to satisfy the standard, but escape the tax. Thus a process standard that induces firms to produce the correct amount of pollution per unit of output will lead to over-production, and a standard that is tight enough to eliminate the over-production will unduly constrain pollution per unit of output. Either way the process standard misses the mark.

When imposed unilaterally by the importing country (as would happen in the absence of a side agreement), the process standard will always err in the direction of unduly constraining pollution per unit of output. This is because the benefit from reducing pollution per unit of output accrues to the importing country, while the cost of abatement is shared between importing consumers and exporting producers. Thus the smaller the Mexican share of the U.S. market, the more the burden would be borne by the Mexican producers and the tighter the process standard would become.

IV. FULL COOPERATION WITHOUT FULL INFORMATION

Once countries agree to cooperate on resolving cross-border

environmental problems, it might seem that the solution is simple: the implementation of the externality tax that would have been imposed had the region been a single country. However there may yet be forces militating against the use of this apparently ideal policy, in favour of more expedient ones. It is often argued that the high costs of administering environmental standards makes them unlikely to be enforced, particularly in developing countries. Establishing and maintaining a system of on-site inspection and monitoring of production facilities can be very expensive, and there may be difficulties in keeping such a system both independent of political forces and free of corruption. If these administrative costs are sufficiently high, it would be better to impose a less direct, but more cheaply enforced, policy.¹⁴⁾ This is recognized by the World Bank (1992, 78) in the following statement.

"Ideally, regulators would attempt to change the behavior of resource users by means of direct policies—for instance, by taxing or regulating emissions. But these measures involve a heavy administrative burden because they target individual polluters or resource users. Blunt policies, such as taxes on polluting inputs are less demanding because they can be implemented through the tax system. [...] So in many cases it will be appropriate that developing countries use blunt policies, which require less stringent monitoring."

Even if the efficiency gains of externality taxes outweigh their administrative costs, exporting countries will face the burden of the

14) This is a similar argument to that for the use of tariffs for revenue generation in developing countries; while tariffs induce distortions that may not arise with domestic taxation instruments, the costs of counting imports at a limited number of entry points may be much less than the expense of administering, say, a value-added tax or an income tax.

latter while not receiving many benefits from the former. So their best private option might be to minimize their costs by not enforcing any pollution policies. Thus countries may ostensibly have very restrictive controls on pollution but effectively have none, due to lack of enforcement.

If the region in question is comprised of both developing and industrialized nations then there is the opportunity for the latter to compensate the former for their monitoring and enforcement costs. But this opens up an aspect of another problem: both the costs of pollution abatement and the environmental damage itself are difficult to measure and prone to misrepresentation. This makes it harder to determine the appropriate means of controlling the pollution and complicates the negotiations as to the transfers necessary to compensate countries that bear a disproportionate burden. This aspect is also addressed by the World Bank (1992, 155-6).

"The potential partners to an international environmental agreement rarely stand to gain or lose equally from it. If an agreement is to work, either it must lead to efficiency gains sufficiently large that all parties can expect to be better off (which rarely happens) or countries must be willing to negotiate transfers to assist those who will lose, [...] Arranging for such transfers will not be simple. The potential parties to an agreement may not share a common view of the urgency of the problem or of the possible solutions. It is extremely difficult to ensure that countries are paid neither more nor less than the extra costs of meeting their international obligations. Every country has incentives to distort the costs or benefits of taking action."

Negotiations between countries must therefore have two distinct goals: determining, on the bases of relative costs and aggregate benefits, what type of environmental policy should be used; and

resolving, on the basis of the distribution of benefits between the countries, who should pay for the abatement program (that is, whether PPP is maintained or if instead VPP should be adopted, where the consumer pays). Our second paper [Ludema and Wooton (1993)] has addressed these issues in a formal model. We provide here a synopsis of our results.

Let us add to our model the assumption that there is an administrative cost to enforcing an externality tax, while production or trade taxes are assumed to remain costless to implement.¹⁵⁾ Suppose also that the true level of this administrative cost is known only by the exporting country, while the importing country has private information as to the strength of the environmental sentiments among its consumers.¹⁶⁾ There are two questions we wish to answer about cooperation between these two countries on trade and environmental policy. First, what are the characteristics of an ideal (first-best) cooperative environmental policy and, second, what type of policy is likely to arise out of bilateral negotiations?

To answer these questions it is useful to think of a policy agreement as a contract, which requires the exporting country to report its administrative cost and specifies the appropriate policies and compensation for each possible report. Thus, for example, the contract would specify that report by the exporting country that of its administrative costs will lead to the choice of a particular pollution

15) We refer to this as an administrative cost, although any sunk cost borne by the exporting country, and associated with reducing the externality per unit of output, win do. While there may be administrative costs associated with production or trade taxes, if they are lower than those of the externality tax, no generality is lost in ignoring them.

16) As in the original paper, this summary will focus on the administrative cost being private information.

policy, with a corresponding transfer being made by the importing country to the exporter.¹⁷⁾ Borrowing terminology from contract theory, we say that a contract is incentive compatible if the exporter can do no better than honestly report the level of its administrative costs; a contract is individually rational if both countries expect to do better under the contract (before hearing the exporter's report) than by not cooperating at all; and a contract is (ex-post) efficient if the appropriate policy is selected, given the costs of enforcing an externality tax. An optimal contract satisfies all three of these conditions.

While our previous discussion showed a production/trade tax to be clearly inferior to a pollution tax, this ranking may now be reversed if the costs of administering the pollution tax are high enough. In particular, compare the aggregate social welfare of the two countries (before subtracting administrative costs) from using the externality tax set at the appropriate level to that from using a production/trade tax set at the (second-best) optimal level. The difference is the efficiency gain from using the externality tax. Now an efficient policy agreement would employ the production/trade tax whenever the administrative cost is greater than the efficiency gain from the externality tax and would employ the externality tax otherwise.

Thus the choice of the best pollution-control instrument (externality tax or tariff) is quite straightforward, but it is more complicated to elicit a truthful report of the administrative cost of an externality tax. For example, imagine that the importer agreed to exactly compensate the exporter for its administrative costs. In that case the exporter would

17) The transfer may be monetary or, in the case of a comprehensive agreement on trade and the environment, the transfer might instead take the form of trade concessions; that is, the exporter is rewarded with increased gains from trade for having enforced its environmental laws.

have an incentive to over- state this cost. It turns out that the optimal contract has a very simple structure: whenever the exporter reports its administrative cost to be less than the efficiency gain from using the externality tax, then the externality tax should be used and a transfer made to the exporter in an amount equal the efficiency gain. Otherwise, the production/trade tax should be imposed. In practice, this contract would not even actually require a report from the exporter. Instead, the agreement could simply leave it up to the exporter to choose the type of policy and require the importer to transfer the efficiency gain to the exporter if it chooses the externality tax. The only other detail of the contract is that there may have to be some additional transfers, independent of policy, to guarantee that both countries are better off than they were prior to the contract, that is, to ensure individual rationality.¹⁸⁾ Now, if the exporting country chooses to impose the externality tax, it will receive its reward but must incur the administrative cost associated with the more efficient tax. Thus if this cost is greater than its reward, it will stick with the production/trade tax. Thus the contract is both incentive compatible and ex-post efficient.

While we have set out the terms of the optimal contract, it is not at all clear that the two countries would ever actually negotiate an agreement having these characteristics. The problem is that, under the optimal contract and if the externality tax is used, the exporter gets to keep the difference between the efficiency gain from the externality

18) There is a wide range of transfers that wig achieve this. The one that is chosen win depend upon the type of bargaining that takes place. We shall discuss this in more detail later. As production taxes, export taxes, and import taxes all have the same effect on aggregate welfare, the distribution of gains might be achieved (to some degree) by deciding who implements the tax and thereby keeps the tax revenue.

tax and its administrative cost. This is caged an information rent. Each country therefore has an incentive to try to alter the contract in such a way as to change expected size of the information rent in its favour. As an example, suppose the structure of bargaining were such that the importer makes a take-it-or-leave-it offer of a contract to the exporter. The importer would propose a contract which, while individually rational and incentive compatible, would not be ex-post efficient. Instead, it would require a transfer from the importer to the exporter smaller than the efficiency gain from the externality tax, should the latter choose to employ the externality tax. This would have the effect of reducing the information rent, but it would also mean that the production/trade tax would be used in some instances where the externality' tax would have been caged for under the optimal contract.

To this point, we have implicitly assumed that, prior to the negotiation of the trade and environmental policy agreement, the exporting country did not have an externality tax already in place. For if it did, the importer would merely have to offer the exporter sufficient compensation to induce it employ the efficient level of that tax, and the question as to the type of tax would be redundant. In such an agreement the exporter's information rent would be zero. This suggests two things: first, the exporter might want to forgo the independent introduction of externality taxes prior to negotiation, if the immediate gain from having them is not too high,¹⁹⁾ so as to preserve its information rent in the negotiated contract; second, if it does choose to forgo externality taxation, that very act may reveal something about the size of its administrative cost to the other country. In particular, by its putting (or not putting) in place pollution taxes, the exporter would signal that the administrative costs were low (or high). In either

19) It may wish to have them for the reasons indicated in section 111.2.

event, some information is revealed, and this revelation reduces the available information rent. A smaller information rent means that there is less reason for the countries to distort the contract in their negotiations. Hence negotiated contracts are likely to be more efficient, the greater is the immediate gain to the exporter from having an externality tax, as this increases the information revealed.

Table 2

North American Agreement on Environmental Cooperation

Article 1: Objectives

The objectives of this Agreement are to:

- (a) foster the protection and improvement of the environment in the territories of the Parties for the well-being of present and future generations;
- (b) promote sustainable development based on cooperation and mutually supportive environmental and economic policies;
- (c) increase cooperation between the Parties to better conserve, protect, and enhance the environment, including wild flora and fauna;
- (d) support the environmental goals and objectives of the NAFTA;
- (e) avoid creating trade distortions or new trade barriers;
- (f) strengthen cooperation on the development and improvement of environmental laws, regulations, procedures, policies and practices;
- (g) enhance compliance with, and enforcement of, environmental laws and regulations;
- (h) promote transparency and public participation in the development of environmental laws, regulations and policies;
- (i) promote economically efficient and effective environmental measures; and
- (j) promote pollution prevention policies and practices.

SOURCE: Government of Canada (1993a)

IV.1. The Parallel Agreements on Trade and the Environment in North America

How do the combined agreements, for free trade and environmental cooperation, compare to what has been suggested by the preceding analysis? The stated objectives of the three nations in negotiating the environmental side agreement are listed in Table 2.

From a trade point of view, the benefits of the NAFTA will largely fall on Mexico, as the smallest country (in the sense of having the least monopoly power in trade).²⁰⁾ We suggested above that the benefits to larger countries may take the form of concessions of some other type, such as the small country's adoption of its partners (more restrictive) environmental standards. Indeed, in the NAFTA negotiations Mexico agreed to adopt the same high levels of pollution abatement as its prospective northern partners. But the NAFTA itself had no means of ensuring that the Mexican government would ensure that its industries adopted the cleaner, and more expensive, production techniques and no mechanism to punish either government or firms for not doing so. In this respect, the side agreement makes some headway.

Article 5 of the side agreement states that "each Party shall effectively enforce its environmental laws and regulations through appropriate governmental action, subject to Article 37, such as: (a) appointing and training inspectors; (b) monitoring compliance and investigating suspected violations, including through on-site inspections; [...]." Article 37 poses a serious constraint on the ability of a government to ensure that pollution controls are being used in

20) Canada had already realised its small-country trade benefits through the original Canada-us Free Trade Agreement.

partner countries. It states that nothing in the side agreement "shall be construed to empower a Party's authorities to undertake environmental law enforcement activities in the territory of another Party.

The side agreement does provide private access to remedies, in that "interested persons" may request investigations of alleged violations of environmental laws and can request that "appropriate action to enforce that Party's environmental laws and regulation" be taken. Should one of the countries consider that a partner has persistently failed to effectively enforce its environmental law then it may take the dispute to the Council of the Commission for Environmental Cooperation (under Article 23) which may, if the dispute is still not resolved, convene an arbitral panel (under Article 24) which shall:

"consider the matter where the alleged persistent pattern of failure by the Party complained against to effectively enforce its environmental law relates to a situation involving workplaces, firms, companies or sectors that produce goods or provide services:

- (a) traded between the territories of the Parties; or
- (b) that compete, in the territory of the Party complained against, with goods or services produced or provided by persons of the other Party."

If the panel determines that there has been a persistent pattern of failure to effectively enforce the environmental laws and the disputing Parties cannot agree (or have not agreed within the requisite time period) to an "'action plan sufficient to remedy the pattern of non-enforcement", then a "monetary enforcement assessment" may be levied. That is, the polluting government may be fined for not forcing its firms to clean up. Should the fine not be paid, a complaining Party

may suspend (under Article 36) "the application to the Party complained against of NAFTA benefits in an amount no greater than that sufficient to collect the monetary enforcement assessment." Thus, for example, the Us can ensure that the environmental improvements that it has bought in exchange for its tariff concessions to Mexico are realised, or it can withdraw the trade benefits Mexico gets from the deal. Thus NAFTA does have a mechanism to ensure compliance with both the trade and environmental obligations of the agreement.

But what of the choice between using an externality tax and a trade restriction to control the pollution? Even if we ignore the problem of eliciting information from the polluting country, there are still institutional barriers to the selection of the most appropriate pollution abatement policy.

Contracting parties face the GATT 1994 requirement of using the least trade-restrictive technical regulation for pollution control. This could be inefficient and counterproductive, in harming the nation it was intended to benefit. Thus the tariff would be more trade-restrictive and consequently deemed unacceptable but, given sufficiently high costs of administering the externality tax, the former could have led to higher welfare for the exporting country. We are considering a cooperative agreement, the NAFTA, and so the parties are unlikely to seek the involvement of the GATT in resolving disputes over the terms of the agreement, but it should be noted that GATT constrains the freedom of countries in forming such bilateral agreements. Exceptions to the GATT principle of nondiscrimination are allowed under Article XXIV which permits the formation of free-trade agreements, such as the EU and the NAFTA. In meeting the conditions of Article xxiv, nations must have "substantially" free trade by elimination of bilateral tariffs. But this would preclude the countries

from agreeing to the imposition of a tariff on exports of firms creating the externality, even when such a tariff is the most efficient instrument (that is, when administrative cost of the externality tax are high).

V. GATT AND FUTURE ENVIRONMENTAL NEGOTIATIONS

Now consider the follow question: if a benevolent world planner knew today that the two countries would negotiate a trade and environmental agreement at a certain point in the future, what trade policies would she recommend today? The answer is that if the time period until the agreement is reached is not too long, she would recommend free trade today. The reason is that, even though it does not correct the cross-border externality, free trade gives the exporter the maximum incentive to use an externality tax for terms-of-trade purposes and thereby increases the efficiency of the future negotiated contract.

Thus, in application of this theory to the multilateral trading system, we find that the GATT, while explicitly renouncing the opportunity to be the mechanism for environmental negotiations, can yet have a significant impact on the nature of such agreements. If trading nations are intent on reaching environmental accords in the near future, then the GATT should attempt to have a trade regime that is most conducive to efficient environmental agreements. The trade deal should be one that creates the strongest private incentive for exporters to use externality taxes before the environmental agreement is reached, which occurs when trade restrictions are eliminated. The GATT's singleminded pursuit of free trade may therefore be a spur to the conclusion of efficient multilateral environmental agreements.²¹⁾

VI. SUMMARY AND CONCLUSIONS

We have examined a very specific aspect of the vast research area encompassing questions of environmental economics and international trade. Our interest has been the inter-relationship between trade policy instruments and pollution abatement measures when the goods being traded generate cross-border externalities that affect the importing country more severely than they hurt the exporter. As a result, the country that can directly control the problem has little interest in doing so; while the other would want to, but does not have the jurisdiction to implement the appropriate first-best policies.

This topic is of especial interest when the countries decide to form a regional trading agreement. First, this type of environmental problem is most likely to arise between contiguous countries, which are also the strongest candidates as partners in a regional agreement. Secondly, a trade agreement limits the ability of an importer to use (second-best) trade policy to control the externality, and hence the change in the trade regime may have serious environmental implications. But, thirdly, it presents the opportunity for the two countries to negotiate a side agreement on the environment, parallel to their trade pact. This cooperation, then, might result in the introduction of first-best environmental measures, which would not occur when the countries act unilaterally. However, optimal policies should not be expected if countries have private information regarding some aspect of the

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- 21) Should a successful conclusion to environmental negotiations be unlikely in the near future, then the trade policy must shoulder the responsibility of limiting pollution; in which case free trade is not optimal and further trade liberalization may lower welfare. So the question here is not so much one of whether the same body should be responsible for both trade and environmental negotiations but whether the discussions can be concluded in close to the same time frame.

environmental problem. Such private knowledge enables its holder to extract information rent, and efficiency can be lost both in the country's attempt to preserve the rent and in its partner's efforts to reduce it.

We have applied our analysis to case of North American trade and economic integration, in particular the negotiation of the NAFTA. Our discussion concluded that the GATT framework has put impediments in the path of countries' unilateral attempts at imposing environmental laws on traded goods. The NAFTA alone does little to facilitate new environmental control measures, save ensuring that the partner countries do not lower their standards to attract "dirty" investment. With the adoption of the environmental side agreement, some leverage is given to countries to ensure that their partners meet their existing environmental obligations

While our primary concern has been with the nature of the appropriate regional agreement on trade and environmental policies, we recognize that these issues are sometimes negotiated separately (for example, the focus of the GATT on purely trade barriers). Our research indicates that free trade is indeed an appropriate goal for trade talks, if an environmental agreement is anticipated not too far in the future. Thus for the advances made by GATT 1994 in trade liberalization to be good for the global environment, they have to be followed by a multilateral, environmental accord.

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