

The Environment and Globalization

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ABSTRACT

Fears that globalization hurts the environment are not well-founded. A survey reveals little statistical evidence, on average across countries, that openness to international trade undermines national attempts at environmental regulation through a “race to the bottom” effect. If anything, favorable “gains from trade” effects dominate, for measures of air pollution such as SO₂ concentrations. Perceptions that WTO panel rulings have interfered with the ability of individual countries to pursue environmental goals are also poorly informed. Recent rulings have in fact confirmed that countries can enact environmental measures, even if they affect trade and even if they concern others’ Processes and Production Methods (PPMs), provided the measures do not discriminate among producer countries.

People care about both the environment and the economy. As real incomes rise, their demand for environmental quality rises. This translates into environmental progress under the right conditions—democracy, effective regulation, and externalities that are largely confined within national borders and are therefore amenable to national regulation. Increasingly, however, environmental problems spill across borders. Global externalities include climate change and ozone depletion. Economic growth alone will not address such problems, in a system where each country acts individually, due to the free rider problem. Multilateral institutions are needed, and national sovereignty is the obstacle, not the other way around.

Introduction

At the Ministerial meeting of the World Trade Organization in Seattle in November 1999, when anti-globalization protestors launched the first of their big demonstrations, some wore turtle costumes. These demonstrators were concerned that international trade in shrimp was harming sea turtles by ensnaring them in nets. They felt that a WTO panel had, in the name of free trade, negated the ability of the United States to protect the turtles, simultaneously undermining the international environment and national sovereignty.

Subsequently, anti-globalization protests became common at meetings of multinational organizations. Perhaps no aspect of globalization worries the critics more than its implications for the environment. The concern is understandable. It is widely (if not universally) accepted that the direct effects of globalization on the economy are positive, as measured by Gross Domestic Product. Concerns rise more with regard to “non-economic” effects of globalization.¹ Of these, some, such as labor rights, might be considered to be a subject properly of national sovereignty, with each nation bearing the responsibility of deciding to what extent it wishes to protect its own labor force, based on its own values, capabilities, and politics. When we turn to influences on the environment, however, the case for countries sticking their noses into each other’s business is stronger. We all share a common planet.

Pollution and other forms of environmental degradation are the classic instance of what economists call an externality. This term means that individual people and firms, and sometimes even individual countries, lack the incentive to restrain their pollution, because under a market system the costs are borne primarily by others, rather than by themselves. The phrase “tragedy of the commons” was originally coined in the context of a village’s shared pasture land, which would inevitably be over-grazed if each farmer were allowed free and unrestricted use. It captures the idea that we will foul our shared air and water supplies and deplete our natural resources unless somehow we are individually faced with the costs of our actions.

A central question for this chapter is whether globalization helps or hurts in achieving the best tradeoff between environmental and economic goals. Do international trade and investment allow countries to achieve more economic growth for any given level of environmental quality? Or do they undermine environmental quality for any given rate of economic growth? Globalization is a complex trend, encompassing many forces and many effects. It would be surprising if all of them were always unfavorable to the environment, or all of them favorable. The highest priority should be to determine ways in which globalization can be successfully harnessed to promote protection of the environment, along with other shared objectives, as opposed to degradation of the environment.

One point emphasized in the chapter is that it is an illusion to think that environmental issues could be effectively addressed if each country were insulated

¹ The quotation marks are necessary around “non-economic,” because economists’ conceptual framework fully incorporates such objectives as environmental quality, even though pollution is an externality that is not measured by GDP. For further reading on how economists think about the environment, see Hanley, Shogren, and White (1997) or Stavins (2000).

against incursions into its national sovereignty at the hands of international trade or the WTO. Increasingly, people living in one country want to protect the air, water, forests, and animals not just in their *own* countries, but also in *other* countries as well. To do so international cooperation is required. National sovereignty is the obstacle, not the ally. Multilateral institutions are a potential ally, not the obstacle.

In the course of this chapter, we encounter three ways in which globalization can be a means of environmental improvement. So the author hopes to convince the reader, at any rate. Each has a component that is new.

First is the exercise of *consumer power*. There is the beginning of a worldwide trend toward labeling, codes of corporate conduct, and other ways that environmentally-conscious consumers can use their purchasing power to give expression and weight to their wishes. These tools would not exist without international trade. American citizens would have little way to dissuade Mexican fishermen from using dolphin-unfriendly nets if Americans did not import tuna to begin with. The attraction of labeling is that it suits a decentralized world, where we have both national sovereignty and consumer sovereignty. Nevertheless, labeling cannot be a completely *laissez faire* affair. There need to be some rules or standards. Otherwise, any producer could inaccurately label its product as environmentally pure, and any country could unfairly put a pejorative label on imports from rival producers. This consideration leads to the second respect in which globalization can be a means of environmental improvement.

We need an international system in which countries interact under a set of *multilateral rules* determined in multilateral negotiations and monitored by multilateral institutions. This is just as true in the case of environmental objectives, which are increasingly cross-border, as of other objectives. It is true that in the past, the economic objectives of international trade have been pursued more effectively by the GATT and other multilateral organizations than have environmental objectives. But multilateral institutions can be made a means of environmental protection. This will sound like pie-in-the-sky to the many who have been taken in by the mantra that recent WTO panel decisions have overruled legislative efforts to protect the environment. But the WTO has actually moved importantly in the environmentalists' direction in recent years. The front lines of multilateral governance currently concern—not illusory alternatives of an all-powerful WTO versus none at all—but rather questions about how reasonably to balance both sets of objectives. One such question is whether countries should be allowed to adopt laws that may be trade-restricting, but that have as their objective influencing other countries' processes and production methods (PPMs), such as their fishermen's use of nets. While the issue is still controversial, the WTO has moved clearly in the direction of answering this question in the affirmative, that is, asserting in panel decisions countries' ability to adopt such laws. The only "catch" is that the measures cannot be unnecessarily unilateral or discriminatory. The environmentalist community has almost entirely failed to notice this major favorable development, because of confusion over the latter qualification. But not only is the qualification what a reasonable person would want, it is secondary to the primary issue of countries' rights under trading system to implement such laws. By ignoring their victory on the main issue, environmentalists risk losing the opportunity to consolidate it. Some players, particularly poor countries, would love to deny the precedent set in these panel decisions, and to return to a system where other countries cannot restrict trade in pursuit of PPMs.

Third, there has recently accumulated *statistical evidence* on how globalization and growth tend to affect environmental objectives on average, even without multilateral institutions. Looking for patterns in the data across countries in recent decades can help us answer some important questions. Increased international trade turns out to have been beneficial for some environmental measures, such as SO₂ pollution. There is little evidence to support the contrary fear that international competition in practice works to lower environmental standards. Rather, globalization aids the process whereby economic growth enables people to demand higher environmental quality. To be sure, effective government regulation is probably required if this demand is ever be translated into actual improvement; the environment cannot take care of itself. But the statistical evidence says that high-income countries do indeed tend to use some of their wealth to clean up the environment, on average, for measures such as SO₂ pollution. [For the increasingly important category of global environmental issues, such as emission of greenhouse gases, regulation at the national level is not enough.]

These three new reasons to think that globalization can be beneficial for the environment—consumer power, multilateralism, and cross-country statistical evidence—are very different in nature. But in each case what is striking is how little the facts correspond to the suspicions of critics that turning back the clock on globalization would somehow allow them to achieve environmental goals. [The rise in globalization, with the attempts at international environmental accord and quasi-judicial oversight, is less a threat to the environment than an ally. It is unfettered national sovereignty that poses the larger threat.]

This chapter will try to lay out the key conceptual points concerning the relationship of economic globalization and the environment, and to summarize the available empirical evidence, with an emphasis on what is new. We begin the chapter by clarifying some basic issues, such as defining objectives, before going on to consider the impact of globalization.

Objectives

It is important to begin a consideration of these issues by making clear that both economic income and environmental quality are worthy objectives. Individuals may disagree on the weight that should be placed on one objective or another. But we should not let such disagreements lead to deadlocked political outcomes in which the economy and the environment are both worse off than necessary. Can globalization be made to improve the environment that comes with a given level of income in market-measured terms? Many seem to believe that globalization necessarily makes things worse. If Mexico grows rapidly, is an increase in pollution inevitable? Is it likely, on average? If that growth arises from globalization, rather than from domestic sources, does that make environmental damage more likely? Less likely? Are there policies that can simultaneously promote *both* economic growth and an improved environment? These are key questions for this chapter.

Two Objectives: GDP and the Environment

An extreme version of environmental activism would argue that we should turn back the clock on industrialization—that it is worth deliberately impoverishing ourselves—if that is what it takes to save the environment. If the human species still consisted of a few million hunter-gatherers, man-made pollution would be close to zero. Thomas Malthus, writing in the early 19th century, predicted that geometric growth in population and in the economy would eventually and inevitably run into the natural resource limits of the carrying capacity of the planet.² In the 1960s, the Club of Rome picked up where Malthus had left off, warning that environmental disaster was coming soon. Some adherents to this school might favor the deliberate reversal of industrialization—reducing market-measured income below current levels in order to save the environment.³

But environmental concerns have become more mainstream since the 1960s. We have all had time to think about it. Most people believe that both a clean environment and economic growth are desirable, that we can have a combination of both, and it is a matter of finding the best tradeoff.

To evaluate the costs and benefits of globalization with regard to the environment, it is important to be precise conceptually, for example to make the distinction between effects on the environment that come *via* rapid economic growth and those that come *for a given level* of economic output.

We have a single concept, GDP, that attempts to measure the aggregate value of goods and services that are sold in the marketplace, and that does a relatively good job of it. Measurement of environmental quality is much less well advanced. There are many different aspects of the environment that we care about, and it is hard to know how to combine them into a single overall measure. It would be harder still to agree on how to combine such a measure with GDP to get a measure of overall welfare. Proponents of so-called *green GDP accounting* have tried to do exactly that, but so far the enterprise is very incomplete. For the time being, the best we can do is look at a variety of separate measures capturing various aspects of the environment.

A Classification of Environmental Objectives

For the purpose of this chapter, it is useful to array different aspects of the environment according to the extent to which damage is localized around specific sources, as opposed to spilling out over a geographically more extensive area.

The first category of environmental damage is pollution that is *internal* to the household or firm. Perhaps 80 percent (by population) of world exposure to particulates is indoor pollution in poor countries—smoke from indoor cooking fires—which need not involve any externality.⁴ There may be a role for dissemination of information regarding long-term health impacts that are not immediately evident. Nevertheless, what households in such countries are primarily lacking is the economic resources to afford stoves that run on cleaner fuels. Some health risks in industrial production are analogous. Workers in every country voluntarily accept dangerous jobs (e.g., in mining and

² Malthus was an economist. A contemporary commentator reacted by calling economics the dismal science. This description has stuck, long after ecology or environmental science broke off as independent fields of study, fields that in fact make economists look like sunny optimists by comparison.

³ Meadows, et al (1972), and Daly (1993). For a general survey of the issues, see Esty (2001).

⁴ Chaudhuri and Pfaff (2002) cite Smith (1993, p.551).

construction) because they pay better than other jobs that are available to someone with the same set of skills.

Some other categories of environmental damage pose potential externalities, but could be internalized by assigning property rights. If a company has clear title to a depletable natural resource such as an oil well, it has some incentive to keep some of the oil for the future, rather than pumping it all today.⁵ The biggest problems arise when the legal system fails to enforce clear divisions of property rights. Tropical forest land that anyone can enter to chop down trees will be rapidly over-logged. Many poor countries lack the institutional and economic resources to enforce laws protecting such resources. Often corrupt arms of the government themselves collude in the plundering. Another example is the dumping of waste. If someone agrees to be paid to let his land be used as a waste disposal site, voluntarily and without hidden adverse effects, there is not necessarily anything wrong with the arrangement. Waste has to go somewhere. But there *is* something wrong if the government of a poor undemocratic country agrees to be paid to accept waste which then hurts the environment and health of residents who lack the information or political clout to participate in the policy decision or to share in the benefits.

A second category, *national externalities*, includes most kinds of air pollution, such as NO_x and SO₂, and water pollution, the latter a particularly great health hazard in the third world. The pollution is external to the individual firm or household, and often external to the state or province as well, but most of the damage is felt within the country in question. Intervention by the government is necessary to control such pollution. There is no reason why each national government cannot undertake the necessary regulation on its own, though the adequacy of economic resources to pay the costs of the regulation is again an issue.

A third category is *international externalities*. Increasingly, as we will see, environmental problems cross national boundaries. Acid rain is an example. In these cases, some cooperation among countries is necessary. The strongest examples are purely *global externalities*: chemicals that deplete the stratospheric ozone layer, greenhouse gases that lead to global climate change, and habitat destruction that impairs biological diversity. In these cases, individual countries should not expect to be able to do much on their own. These distinctions will turn out to be important.

The Relationship Between Economic Production and the Environment

Scholars often catalog three intermediating variables or channels of influence that can determine the aggregate economic impacts of trade or growth on the environment.

- First is the *scale* of economic activity: for physical reasons, more output means more pollution, other things equal. But other things are usually not equal.

⁵ Even when property rights are not in doubt and there is no externality, a common environmental concern is that the welfare of future generations does not receive enough weight, because they are not here to represent themselves. From the economists' viewpoint, the question is whether the interest rate that enters firms' decisions incorporates the correct *discount rate*. This topic is beyond the scope of this chapter, but Goulder and Stavins (2002) provide a concise survey.

- Second is the *composition* of economic activity: Trade and growth can shift the composition of output, for example, among the agricultural, manufacturing, and service sectors. Because environmental damage per unit of output varies across these sectors, the aggregate can shift.
- Third are the *techniques* of economic activity: Often the same commodity can be produced through a variety of different techniques, some cleaner than others. Electric power, for example, can be generated by a very wide range of fuels and techniques.⁶ To the extent trade or growth involve the adoption of cleaner techniques, pollution per unit of GDP will fall.

The positive effects of international trade and investment on GDP are already moderately well-established, both theoretically and empirically. The relationship between GDP and the environment is not quite as well understood, and is certainly less of a constant relationship. The relationship is rarely monotonic: sometimes a country's growth first is bad for the environment and later good. The reason is the three conflicting forces that were just noted. On the one hand, when GDP increases, the greater scale of production leads directly to more pollution and other environmental degradation. On the other hand, there tend to be favorable shifts in the composition of output and in the techniques of production. The question is whether the latter two effects can outweigh the first.⁷

The Environmental Kuznets Curve

A look at data across countries or across time allows some rough generalization as to the usual outcome of these conflicting effects. For some important environmental measures, a U-shaped relationship appears: at relatively low levels of income per capita, growth leads to greater environmental damage, until it levels off at an intermediate level of income, after which further growth leads to improvements in the environment. This empirical relationship is known as the Environmental Kuznets Curve. The label is by analogy with the original Kuznets curve, which was a U-shaped relationship between average income and inequality. The World Bank (1992) and Grossman and Krueger (1993, 1995) brought to public attention this statistical finding for a cross section of countries.⁸ Grossman and Krueger (1995) estimated that SO₂ pollution peaked when a country's income was about \$5,000-\$6,000 per capita (in 1985 dollars).

⁶ The most important alternatives are:

- coal-fired plants (the dirtiest fuel, though there is a little scope for mitigating the damage, through low-sulphur coal, scrubbers, and perhaps someday new carbon-sequestration technologies);
- petroleum products (not quite as dirty);
- solar (very clean, but much more expensive); and
- hydro and nuclear (very clean with respect to pollution, but controversial on other environmental grounds).

⁷ The literature is surveyed in Dean (1992, 2001).

⁸ Grossman and Krueger (1993, 1995) found the Kuznets curve pattern for urban air pollution (SO₂ and smoke) and several measures of water pollution. Selden and Song (1994) found the pattern for SO₂, suspended particulate matter (PM), NO_x, and carbon monoxide. Shafik (1994) found evidence of the U shape for deforestation, suspended PM, and SO₂, but not for water pollution and some other measures.

For countries where a long enough time series of data is available, there is also some evidence that the same U-shaped relationship can hold across time. The air in London was far more polluted in the 1950s than it is today. (The infamous “pea soup” fogs were from pollution.) The same pattern has held in Tokyo, Los Angeles, and other cities. A similar pattern holds typically with respect to deforestation in rich countries: the percentage of U.S. land that was forested fell in the 18th century and first half of the 19th century, but rose in the 20th century.⁹

The idea behind the Environmental Kuznets curve is that growth is bad for air and water pollution at the initial stages of industrialization, but later on reduces pollution, as countries become rich enough to pay to clean up their environments. The dominant theoretical explanation is that production technology makes some pollution inevitable, but that demand for environmental quality rises with income. The standard rationale is thus that, at higher levels of income per capita, growth raises the public’s demand for environmental quality, which can translate into environmental regulation. Environmental regulation, if effective, then translates into a cleaner environment. It operates largely through the techniques channel, encouraging or requiring the use of cleaner production techniques for given products, although regulation might also have a composition effect: raising the price of polluting goods and services relative to clean ones and thus encouraging consumers to buy more of the latter.¹⁰

It would be inaccurate to portray the Environmental Kuznets Curve as demonstrating—or even claiming—that if countries promote growth, the environment will eventually take care of itself. Only if pollution is largely confined within the home or within the firm does that Panglossian view necessarily apply.¹¹ Most pollution, such as SO₂, NO_x, etc., is external to the home or firm. For such externalities, higher income and a popular desire to clean up the environment are not enough. There must also be effective government regulation, which usually requires a democratic system to translate the popular will into action (something that was missing in the Soviet Union, for example), as well as the rule of law and reasonably intelligent mechanisms of regulation. The empirical evidence confirms that the participation of well-functioning democratic

Among more recent studies, Hilton and Levinson (1998) find the U-shaped relationship for automotive lead emissions and Bradford, Schlieckert and Shore (2000) find some evidence of the environmental Kuznets curve for arsenic, COD, dissolved oxygen, lead and SO₂, while obtaining more negative results in the cases of PM and some other measures of pollution. Bimonte (2001) finds the relationship for the percentage of land that is protected area, within national territory. Harbaugh, Levinson, and Wilson (2000) point out that the relationship is very sensitive with respect, for example, to functional form and updating of the data set. The evidence is generally against the proposition that the curve turns down in the case of CO₂ (e.g., Holtz-Eakin and Selden, 1995), as is discussed later.

⁹ Cropper and Griffiths (1994) find little evidence across countries of an EKC for forest growth. But Foster and Rosenzweig (2003) find supportive evidence in the time series for India.

¹⁰ Theoretical derivations of the environmental Kuznets curve include Andreoni and Levinson (2001), Jaeger and Kolpin (2000), Selden and Song (1995) and Stokey (1998), among others.

¹¹ Chaudhuri and Pfaff (2002) find a U-shaped relationship between income and the generation of indoor smoke, across households. In the poorest households, rising incomes mean more cooking and more indoor pollution. Still-higher incomes allow a switch to cleaner fuels. Individual families make the switch on their own, as they gain the wherewithal to do so. Government intervention is not required.

governments is an important part of the process. [That is at the national level. The requirements for dealing with cross-border externalities are greater still.]

Another possible explanation for the pattern of the Environmental Kuznets Curve is that it works naturally via the composition of output. In theory, the pattern could result from the usual stages of economic development: the transition from an agrarian economy to manufacturing, and then from manufacturing to services. Services tend to generate less pollution than heavy manufacturing.¹² This explanation is less likely than the conventional view to require the mechanism of effective government regulation. If the Kuznets curve in practice resulted solely from this composition effect, however, then high incomes should lead to a better environment even when externalities arise at the international level, which is not the case. [No Kuznets curve has yet appeared for carbon dioxide, for example. Even though emissions per unit of GDP do tend to fall, this is not enough to reduce overall emissions, in the absence of a multilateral effort.]

Regulation

It will help if we clarify one more fundamental set of issues before we turn to the main subject of the chapter, the role of globalization per se.

It is logical to expect environmental regulation to cost something, to have a negative effect on measured productivity and income per capita. “There is no free lunch,” Milton Friedman famously said. Most tangible good things in life cost something, and for many kinds of regulation, if effective, people will readily agree that the cost is worth paying. Cost-benefit tests and cost-minimization strategies are economists’ tools for trying to make sure that policies deliver the best environment for a given economic cost, or the lowest economic cost for a given environmental goal. Taxes on energy, for example, particularly on hydrocarbon fuels, are quite an efficient mode of environmental regulation (if the revenue is “recycled” efficiently); while CAFE standards are somewhat less efficient (differentiated CAFE standards, for example, probably encouraged the birth of the SUV craze); and crude “command and control” methods are less efficient still (e.g., government mandates regarding what specific technologies firms must use). Some environmental regulations, when legislated or implemented poorly, can impose very large and unnecessary economic costs on firms, and workers, and consumers.

Occasionally there are policy measures that have both environmental and economic benefits. Usually these “win-win” ideas constitute the elimination of some previously existing distortion in public policy. Many countries have historically subsidized the use of coal. The United States subsidizes mining and cattle grazing on federal land, and sometimes logging and oil drilling as well, not to mention water use. Other countries have substantial subsidies for ocean fishing. Elimination of such subsidies would improve the environment and save money at the same time—not just for the federal budget, but for people’s real income in the aggregate as well. Admittedly the economists’ approach—taxing gasoline or making ranchers pay for grazing rights—is often extremely unpopular politically.

Another idea that would have economic and environmental benefits simultaneously would be to remove all barriers against international trade in

¹² Arrow, et al, (1995); Panayotou, (1993).

environmental equipment and services, such as those involved in renewable energy generation, smokestack scrubbing, or waste treatment facilities. There would again be a double pay-off: the growth-enhancing effect of elimination barriers to exports (in a sector where the United States is likely to be able to develop a comparative advantage), together with the environment-enhancing effect of facilitating imports of the inputs that go into environmental protection.

There is a different school of thought that claims many opportunities for saving money while simultaneously saving the environment. The *Porter Hypothesis* holds that a tightening of environmental regulation stimulates technological innovation and thereby has positive effects on both the economy and the environment—for example, saving money by saving energy.¹³ The analytical rationale for this view is not always made clear. (Is the claim that a change in regulation, regardless in what direction, stimulates innovation, or is there something special about environmental regulation? Is there something special about the energy sector?) Its proponents cite a number of real-world examples where a new environmental initiative turned out to be profitable for a given firm or industry. Such cases surely exist, but there is little reason to think that a link between regulation and productivity growth holds as a matter of generality. The hypothesis is perhaps better understood as making a point regarding “first mover advantage.” That is, if the world is in the future to be moving in a particular direction, such as toward more environmentally friendly energy sources, then a country that innovates new products and new technologies of this sort before others do will be in a position to sell the fruits to the latecomers.

Effects of Openness to Trade

The central topic of this chapter is the implications of trade for the environment. Some effects come via economic growth, and some come even for a given level of income. In both cases, the effects can be either beneficial or detrimental. Probably the strongest effects are the first sort, via income. Much like saving and investment, technological progress, and other sources of growth, openness tends to raise income. As we have seen, higher income in turn has an effect on some environmental measures that is initially adverse but, according to the Environmental Kuznets Curve, eventually turns favorable.

What about effects of trade and investment that do not operate via economic growth? They can be classified in three categories: systemwide effects that are adverse, systemwide effects that are beneficial, and effects that vary across countries depending on local “comparative advantage.”

Race to the Bottom

The “*race to the bottom*” hypothesis is perhaps the strongest basis for fearing that international trade and investment specifically (rather than industrialization generally) will put downward pressure on countries’ environmental standards and thus damage the

¹³ Porter and van der Linde (1995).

environment across the global system. Leaders of industry, and of the unions whose members are employed in industry, are always concerned about competition from abroad. When domestic regulation raises their costs, they fear that they will lose competitiveness against firms in other countries. They warn of a loss of sales, employment, and investment to foreign competitors.¹⁴ Thus, domestic producers often sound the competitiveness alarm as a way of applying political pressure on their governments to minimize the burden of regulation.¹⁵

To some, the phrase “race to the bottom” connotes that the equilibrium will be a world of little or no regulation. Others emphasize that, in practice, it is not necessarily a matter of globalization leading to environmental standards that literally decline over time, but rather retarding the gradual raising of environmental standards that would otherwise occur. Either way, the concern is that, to the extent that countries are open to international trade and investment, environmental standards will be lower than they would otherwise be. But how important is this in practice? Economists’ research suggests that environmental regulation is not one of the more important determinants of firms’ ability to compete internationally. When deciding where to locate, multinational firms seem to pay far more attention to such issues as labor costs and market access than to the stringency of local environmental regulation.¹⁶

Once again, it is important to distinguish (1) the fear that globalization will lead to a race to the bottom in regulatory standards, from (2) fears that the environment will be damaged by the very process of industrialization and economic growth itself. Opening of national economies to international trade and investment could play a role in both cases, but the two possible channels are very different. In the first case, the race to the bottom hypothesis, the claim is that openness undermines environmental standards even for a given path of economic growth. This would be a damning conclusion from the standpoint of globalization, because it would imply that by limiting trade and investment in some way, we might be able to attain a better environment for any given level of GDP. In the second case, the implication would be that openness only affects the environment in the way that investment, or education, or productivity growth, or any other source of growth affects the environment, by moving the economy along the Environmental Kuznets

¹⁴ Levinson and Taylor (2001) find that those U.S. industries experiencing the largest rise in environmental control costs have indeed also experienced the largest increases in net imports.

¹⁵ What is competitiveness? Economists tend to argue that concerns regarding international competitiveness, if interpreted as fears of trade deficits, are misplaced, which would seem to imply they should not affect rational policy-making. (Or else, to the extent competitiveness concerns can be interpreted as downward pressure on regulation commensurate with cost considerations, economists figure that they may be appropriate and efficient.) But Esty and Gerardin (1998, p.17-21) point out that competitiveness fears, under actual political economy conditions, may inhibit environmental regulation even if they are not fully rational. Ederington and Minier (2002) find econometrically that countries do indeed use environmental regulation to reduce trade flows—that they tend to adopt less-stringent environmental regulations for their import-competing industries than for others.

¹⁶ Jaffe, Peterson, Portney and Stavins (1995), Grossman and Krueger (1993), Low and Yeats (1992), and Tobey (1990). Other empirical researchers, however, have found more of an effect of environmental regulation on direct investment decisions: Lee and Roland-Holst (1997) and Smarzynska and Wei (2001). Theoretical analyses include Copeland and Taylor (1994, 1995, 2001) and Liddle (2001).

Curve. Trying to restrict trade and investment would be a less attractive strategy in this case, because it would amount to deliberate self-impoverishment.

Gains from Trade

While the possibility that exposure to international competition might have an adverse effect on environmental regulation is familiar, less widely recognized and more surprising is the possibility of effects in the beneficial direction, which we will call the *gains from trade hypothesis*. Trade allows countries to attain more of what they want, which includes environmental goods in addition to market-measured output.

How could openness have a positive effect on environmental quality even setting aside the possibility of accelerating progress down the beneficial slope of the Environmental Kuznets Curve? A first possibility concerns technological and managerial innovation. Openness encourages ongoing innovation.¹⁷ It then seems likely that openness encourages innovation beneficial to environmental improvement as well as economic progress. A second possibility is an international ratcheting up of environmental standards.¹⁸ The largest political jurisdiction can set the pace for others. Within the United States, it is called the “California effect;” when the largest state sets high standards for auto pollution control equipment, for example, the end result may be similar standards in other states as well. The United States can play the same role globally.

Multinational corporations (MNCs) are often the vehicle for these effects. They tend to bring clean state-of-the-art production techniques from high-standard countries of origin, to host countries where they are not yet known, for several reasons:

“First, many companies find that the efficiency of having a single set of management practices, pollution control technologies, and training programmes geared to a common set of standards outweighs any cost advantage that might be obtained by scaling back on environmental investments at overseas facilities. Second, multinational enterprises often operate on a large scale, and recognise that their visibility makes them especially attractive targets for local enforcement officials...Third, the prospect of liability for failing to meet standards often motivates better environmental performance...”—Esty and Gentry (1997, p.161)

The claim is not that all multinational corporations apply the highest environmental standards when operating in other countries, but that the standards tend on average to be higher than if the host country were undertaking the same activity on its own.¹⁹ Corporate codes of conduct, as under the U.N. Global Compact promoted by Kofi Annan,

¹⁷ Trade speeds the absorption of frontier technologies and best-practice management. This explains why countries that trade more appear to experience a sustained increase in growth rather than just the one-time increase in the level of real income predicted by classical trade theory.

¹⁸ E.g., Vogel (1995), Braithwaite and Drahos (2000), Porter (1990, 1991) and Porter and van der Linde (1995). This ratcheting up may be more effective for product standards than for standards regarding processes and production methods.

¹⁹ Esty and Gentry (1997, pp. 157, 161, 163) and Schmidheiny (1992).

offer a new way that residents of some countries can pursue environmental goals in other countries.²⁰

Furthermore, because trade offers consumers the opportunity to consume goods of greater variety, it allows countries to attain higher levels of welfare (for any given level of domestically produced output), which, as before, will raise the demand for environmental quality. Again, if the appropriate institutions are in place, this demand for higher environmental quality will translate into effective regulation and the desired reduction in pollution.

Attempts to Evaluate the Overall Effects of Trade on the Environment

If a set of countries opens up to trade, is it on average likely to have a positive or negative effect on the environment [for a given level of income]? Which tend in practice to dominate, the unfavorable “race to the bottom” effects or the favorable “gains from trade” effects? Econometrics can help answer the question.

Statistically, some measures of environmental quality are positively correlated with the level of trade. Figure 1 on page 34 shows a rough inverse correlation between countries’ openness to trade and their levels of SO₂ pollution. But the causality is complex, running in many directions simultaneously. One would not want to claim that trade leads to a cleaner environment, if in reality they are both responding to some other third factor, such as economic growth or democracy.²¹

Eiras and Schaeffer (2001, p. 4) find: “In countries with an open economy, the average environmental sustainability score is more than 30 percent higher than the scores of countries with moderately open economies, and almost twice as high as those of countries with closed economies.” Does this mean that trade is good for the environment? Not necessarily. It might be a result of the Porter hypothesis—environmental regulation stimulates productivity—together with the positive effect of income on trade. Or it might be because democracy leads to higher levels of environmental regulation, and democracy is causally intertwined with income and trade. As noted, democracy raises the demand for environmental regulation. Figure 1 suggests that the relationship between SO₂ concentrations and openness is even clear if one controls for the beneficial effect of democracy. But there remain other possible third factors.

A number of studies have sought to isolate the independent effect of openness. Lucas, et al. (1992), study the toxic intensity implied by the composition of manufacturing output in a sample of 80 countries, and find that a high degree of trade distorting policies increased pollution in rapidly growing countries. Harbaugh, Levinson, and Wilson (2000) report in passing a beneficial effect of trade on the environment, after controlling for income. Dean (2002) finds a detrimental direct of liberalization for a given level of income, via the terms of trade, though this is outweighed by a beneficial indirect effect via income. Antweiler, Copeland and Taylor (2001) and Copeland and Taylor (2002) represent an extensive body of empirical research explicitly focused on the effects of trade on the environment. They conclude that trade liberalization that raises the scale of economic activity by 1 per cent works to raise SO₂ concentrations by ¼ to ½ % via the

²⁰ Ruggie (2002).

²¹ Barrett and Graddy (2000) is one of several studies to find that an increase in civil and political freedoms significantly reduces some measures of pollution.

scale channel, but that the accompanying technique channel reduces concentrations by 1/4 to 1 1/2%, so that the overall effect is beneficial. But none of these studies makes allowance for the problem that trade may be the *result* of other factors rather than the cause. Antweiler, et al, point out this potential weakness.²²

Frankel and Rose (2002) attempt to disentangle the various causal relationships. The study focuses on exogenous variation in trade across countries, attributable to factors such as geographical location. It finds effects on several measures of air pollution (particularly SO₂ and NO_x concentrations), for a given level of income, that are more good than bad. This suggests that the “gains from trade” effects may be at least as powerful as the “race to the bottom” effect. The conclusions do not extend to other measures of environmental quality, such as CO₂, however.

Differential Effects Arising from Comparative Advantage

So far we have only considered effects that could be expected to hold for the average country, to the extent that it is open to international trade and investment. What if the environment improves in some countries and worsens in others? An oft-expressed concern is that, to the extent that countries are open to international trade and investment, some will specialize in producing dirty products, and export them to other countries. Such countries could be said to exploit a comparative advantage in pollution. The prediction is that the environment will be damaged more in this set of countries, as compared to what would happen without trade. Of course, the environment will be cleaner in the second set of countries, those that specialize in clean production and instead import the dirty products from the other countries. Leaving aside the possibility of a race to the bottom effect, the worldwide environment on average might even benefit somewhat, just as aggregate output should benefit, because of the gains from trade. But not everyone would approve of such a bargain.

What determines whether a given country is expected to be in the set of economies specializing in clean or dirty environmental production? There are several possible determinants of comparative advantage.

Endowments and Comparative Advantage

First, trade patterns could be determined by endowments of capital and labor [as in the standard neoclassical theory of trade, attributed to Heckscher, Ohlin, and Samuelson]. Assume manufacturing is more polluting than alternative economic activities, such as services. (If the alternative, say agriculture, is instead just as polluting as manufacturing, then trade has no overall implications for the environment.) Since manufacturing is capital intensive, the country with the high capital/labor ratio—say Japan—will specialize in the dirty manufactured goods, while countries with low capital/labor ratios—say China—will specialize in cleaner goods.

²² A few authors have sought to address some aspects of the problem of endogeneity. Levinson (1999) shows that controlling for endogeneity of environmental regulation can change results, in his study of hazardous waste trade. Dean (2002) treats income as endogenous in her study of the effect of trade liberalization on water pollution across Chinese provinces. But the existing research does not directly address the problem that trade may be simultaneously determined with income and environmental outcomes.

For example, Grossman and Krueger predicted that NAFTA might reduce overall pollution in Mexico and raise it in the United States and Canada, because of the composition effect: Mexico has a comparative advantage in agriculture and labor-intensive manufacturing, which are relatively cleaner, versus the northern comparative advantage in more capital intensive sectors. [Overall, there might be a slight environmental benefit, from the movement of dirty activities to the U.S. and Canada, where they are more highly regulated.] This composition effect runs in the opposite direction from the usual worry, that trade would turn Mexico into a pollution haven as a result of high demand for environmental quality in the United States. That theory is discussed in the next section, below.

Second, comparative advantage could be determined by endowments of natural resources. A country with abundant hardwood forests will tend to export them if given the opportunity to do so. Here there cannot be much doubt that trade is indeed likely to damage the environment of such countries. True, in theory, if clear property rights can be allocated and enforced, someone will have the proper incentive to conserve these natural resources for the future. In practice, it seldom works this way. Poor miners and farmers cannot be kept out of large tracts of primitive forest. And even if there were clear property rights over the natural resources, private firms would not have the correct incentives to constrain external side effects of logging and mining, such as air and water pollution, soil erosion, loss of species, and so on. Government regulation is called for, but is often stymied by the problems of inadequate resources, at best, and corruption, at worst.

Pollution Havens

Third, comparative advantage could be deliberately created by differences in environmental regulation itself. This is the pollution haven hypothesis. The motivation for varying levels of regulation could be differences in demand for environmental quality, arising, for example, from differences in income per capita. Or the motivation could be differences in the supply of environmental quality, arising, for example, from differences in population density.

Many object to an “eco dumping” system according to which economic integration results in some countries exporting pollution to others, even if the overall global level of pollution does not rise.²³ Many object to the idea that the impersonal market system would deliberately allocate environmental damage to an “underdeveloped” country. A Chief Economist of the World Bank once signed his name to an internal memo with economists’ language that read (in the summary sentence of its most inflammatory passage) “Just between you and me, shouldn’t the World Bank be encouraging *more* migration of the dirty industries to the LDCs?” After the memo was leaked, public perceptions of the young Larry Summers were damaged for years.

There is a little empirical evidence, but not much, to support the hypothesis that countries that have a particularly high demand for environmental quality—the rich countries—currently specialize in products that can be produced cleanly, and let the poor

²³ The desire to “harmonize” environmental regulation across countries, and the arguments against it, are analyzed by Bhagwati and Srinivasan (1996).

countries produce and sell the products that require pollution.²⁴ There is even less evidence supporting the hypothesis that countries that are endowed with a particularly high supply of environmental quality—those with high land area per capita—import pollution from those that are more densely populated.

Is the Majority of U.S. Trade and FDI with Low-standard Countries?

To listen to some American discussion of globalization, one would think that the typical partner in U.S. trade and investment is a poor country with low environmental or labor standards. If so, it would help explain the fear that opening to international trade and investment in general puts downward pressure on U.S. standards. In fact, less than half of US trade and investment takes place with partners who have lower wages and lower incomes than we do. Our most important partners have long been Canada, Japan, and the European Union (though Mexico has now become important as well). These trading partners sometimes regard the United States as the low-standard country.

Does Economic Globalization Conflict with Environmental Regulation?

There is a popular sense that globalization is a powerful force undermining environmental regulation. This can be the case in some circumstances. The “race to the bottom” phenomenon can potentially put downward pressure on the regulatory standards of countries that compete internationally in trade and investment. But, as an argument against globalization, it leaves much out.

First is the point that, for most of us, environmental quality is one goal, but not the only goal. As already noted, we care also about income, and trade is one means of promoting economic growth. The goals often need to be balanced against each other.

Environmental concerns can be an excuse for protectionism. If policymakers give in to protectionist arguments and erect trade barriers, we will enjoy less growth in trade and income. We will not even necessarily end up with a better environment. Economists point out that import-competing corporations (or their workers), in sectors that may themselves not be particularly friendly to the environment, sometimes seek to erect or retain barriers to imports in the name of environmental protection, when in reality it is their own pocketbooks they are trying to protect. In other words, environmentalism is an excuse for protectionism.

Often, the problem is less sinister, but more complex. To see how the political economy works, let us begin with the point that most policy debates are settled as the outcome of a complicated mix of multiple countervailing arguments and domestic interest groups on both sides. Most of the viewpoints are in some way represented “at the table” in the federal government decision-making process. In the case of environmental measures, there are often adversely affected industry groups sitting across the table from the environmentalists, and they have an effect on the final political outcome. But when

²⁴ E.g., Suri and Chapman (1998) find that middle-income countries’ growth only leads to lower domestic pollution if they increase imports of manufactures. Muradian, O’Connor and Martinez-Alier (2001) find evidence that the imports of rich countries embody more air pollution than their exports. But Frankel and Rose (2002) find no evidence of the hypothesized pattern in which rich open countries are cleaner than poor open countries, controlling for income.

the commodity in question happens to be produced by firms in foreign countries, then that point of view largely disappears from the table around which the decision is made. If the issue is big enough, the State Department may weigh in to explain the potential costs facing foreign countries. But, understandably, the foreigners receive less weight in the policy process than would the identical firms if they were American. The result is that the environmental policies that are adopted on average can discriminate against foreign firms relative to domestic firms, without anyone ever deliberately having supported a measure out of protectionist intent.

One possible example is the strong opposition in Europe to Genetically Modified Organisms (GMOs). A Biosafety Agreement was negotiated in Montreal, January 29, 2000, in which the US felt it had to agree to label grain shipments that might in part be bio-engineered, and to allow countries to block imports of GMOs.²⁵ In some ways, these negotiations might serve as a useful model for compromise in other areas.²⁶ But why have Europeans decided so definitively that they want to keep out genetically modified varieties of corn, despite the emergence of little or no scientific evidence against them as of yet, where American consumers are far less agitated? Is it because Europeans are predisposed to have higher standards for environmental issues? Perhaps.²⁷ An important part of the explanation, however, is that Monsanto and other US technology companies, and US farmers, are the ones who developed the technology and produce the stuff, not European companies or European farmers. Thus it is American producers, not Europeans, who stand to lose from the European squeamishness. European agriculture need not consciously launch a campaign against GMOs. All that the European movement needed was an absence around the table of producers who would be adversely affected by a ban. But the result is to reduce trade, hurt American producers, and benefit European farmers.

Whatever the source of different perceptions across countries, it is important to have a set of internationally agreed rules to govern trade, and if possible a mechanism for settling disputes that arise. That is the role of the WTO. The need for such an institution does not vanish if environmental issues are a part of the dispute, either in reality or according to the claims of one side or the other. Certainly if one cares at all about trade and growth, then one cannot automatically sign on to each and every campaign seeking to block trade on environmental grounds. But even if one cares solely about the environment, one can be easily misled; corporations make dubious claims to environmental motivations in, for example, seeking federal support of “Clean Coal” research or ethanol production. Most of the time, there is no substitute for investigating

²⁵ *The Economist*, Feb. 5, 2000. So far, the United States has been reluctant to bring the GMO case to the WTO, out of a fear of that the outcome might be a political failure even if a legal success. As Victor and Runge (2002, 112-113) argue, the Europeans were sufficiently traumatized in the 1990s by a series of scandals in the regulation of their food, such as the UK government’s failure to stop “Mad Cow” disease, that an attempt by the US to use the WTO dispute settlement process to pry the European market open for GMOs would be counterproductive, regardless of the scientific evidence. But the United States may go ahead anyway.

²⁶ Environmental NGOs were allowed inside the meeting hall, a new precedent. *FT*, Feb. 1, 2000.

²⁷ But it is interesting that some health issues have gone the other way. The U.S. has in the past cared more about feared carcinogens than Europeans. The US requires cheese to be pasteurized, and the EU does not. (David Vogel, 1995.)

the details and merits of the case in question. One should not presume that an interest group's claims are right just because that group happens to be of one's own nationality.

The Impossible Trinity of Global Environmental Regulation

The concerns of anti-globalizers can be understood by means of a trilemma of regulation, called the principle of the Impossible Trinity of Global Governance. In designing a system of global governance, three kinds of goals are desirable. First, *globalization* is desirable, other things equal, for its economic benefits if nothing else. Second, *regulation* is desirable when it comes to externalities like pollution, or other social goals not adequately addressed by the marketplace. Third, national *sovereignty* is desirable, because different countries have different needs or preferences, and also because nations take pride in their political independence. The principle of the Impossible Trinity points out that it is feasible to design a system with any two of these attributes, but not with all three.

The three attributes are represented as the sides of the triangle in figure 2 on page 35. The lower left corner represents a system of complete laissez faire. The private market is given responsibility for everything. With no government regulation, there is nothing to coordinate internationally, and thus no loss in national sovereignty. If another country wants to make the mistake of heavy-handed intervention, that is its affair. One can imagine Friederich von Hayek, Ayn Rand, or Milton Friedman favoring the laissez faire corner.

The lower right corner represents a system of regulation at the global level. While there are not many "world federalists" around today, a proposal to establish a powerful World Environment Organization would be a step in this direction.

The top corner represents isolationism. Only if countries cut themselves off from trade, investment, and other international interactions, can they preserve complete national sovereignty, while practicing whatever kind of regulation they wish. Two candidates in the year 2000 U.S. presidential election, Ralph Nader and Pat Buchanan, seemed to want to move in this direction.

The environmental concerns created by globalization can be understood in terms of this diagram. The process of international economic integration is moving the United States and most other countries downward in the graph, toward the bottom side of the triangle. As a result, globalization is creating a growing conflict between the needs of environmental regulation and the demands of national sovereignty, or so goes the theory. National sovereignty has been winning, which means that the movement has been toward the lower left corner. The claim is that globalization has undermined the ability of sovereign governments to impose the level of environmental standards they would like.

Although the impossible trinity can be a useful way to think about the potential for globalization to undercut national environmental regulation, it can be very misleading in some contexts. There are two main reasons for this. First, even for environmental externalities that are largely confined within countries, such as local air pollution, there is little empirical evidence that the "race to the bottom" hypothesis in fact holds [i.e., that international trade and investment in fact put significant downward pressure on environmental regulation]. Indeed, international trade and activities of multinational corporations may sometimes put upward pressure on environmental standards. Second, and more importantly, some environmental issues spill over across national borders even

in the absence of international trade and investment, making it difficult for individual countries to address them through independent regulation.

Environmental Concerns Cross National Borders

Even those who do not care about trade at all should appreciate the need for some international agreements and institutions. The reason is the increasing importance of major sources of environmental damage that cross national borders, and that would do so even if there were no such thing as international trade. Some externalities have long spilled over from each country to its neighbors—such as SO₂ pollution, which is responsible for acid rain, or water pollution, which flows downriver. They can be addressed by negotiations between the two countries involved (e.g., U.S. and Canada). An increasing number of environmental externalities are truly global, however. The best examples are greenhouse gases. A ton of carbon dioxide creates the same global warming potential regardless where in the world it is emitted. Other good examples of direct global externalities are stratospheric ozone depletion, depletion of ocean fish stocks, and threats to biodiversity.

Even localized environmental damage, such as deforestation, is increasingly seen as a valid object of international concern. A distinction is traditional between trade measures that target specific undesirable products, such as asbestos, and those that target *Processes and Production Methods* (PPMs), such as the use of prison labor in the manufacture of the commodity in question. It is clear that a country concerned about its own health or environment has the right to tax or ban products that it regards as harmful, so long as it does not discriminate against foreign producers. Indeed, such bans are less liable to become a vehicle for surreptitious protectionism, than are attempts to pass judgment on other countries' production methods that are unrelated to the physical attributes of the product itself. But is it legitimate for importing countries also to discriminate according to how a given product was produced? Some ask what business is it of others whether the producing country wants to use prison labor, or cut down its own forests, or pollute its own environment?²⁸

Often an international externality can be easily identified. Forests absorb carbon dioxide (a process called sequestration, or creating carbon sinks), so logging contributes to global climate change. An endangered species may contain a unique genetic element that someday could be useful to international scientists. Desertification can lead to social instability and political conflict, which can in turn produce problems for international security. Thus environmental damage in one country can have indirect effects on others.

But foreign residents increasingly care about localized environmental damage, even when they live far away and even when there is no evident link to their interests. The idea of “non-use value” is that many people place value on keeping, for example, a river canyon unspoiled, even if they know they will never see it. While the methodology of estimating the value according to what people say they would pay (“contingent valuation”) is fraught with problems, the basic principle of non-use value is now widely

²⁸ See Charnovitz (2002a) on the history, law, and analysis of PPMs, and for other references. He argues that the public failure to understand environment-friendly developments in the late 1990s within GATT/WTO jurisprudence regarding PPMs is now an obstacle to further progress (e.g., in the WTO Committee on Trade and Environment; p. 64, 103-04).

accepted. This means that citizens in one country may have a stake in whether another country dams up a gorge, kills its wildlife, or pollutes its air and water.

Reversing Globalization Would Not End the Tension of Regulation vs. Sovereignty

Thus, for an increasingly important set of environmental issues, the idea that individual countries could properly address the issues if left on their own is myth. If countries do not cooperate through multilateral institutions, each will be tempted to free ride on the efforts of others, and little will get done. Globalization and multilateral institutions are not the obstacle—and the appeal of national sovereignty is not an ally—in international efforts to protect the environment. Rather, environmentalists need global agreements and global agencies if they are going to get other countries to do the things they want them to do. It is the appeal of national sovereignty that is the obstacle.

The mistake of blaming all ills on globalization and multilateral institutions such as the WTO has yielded some very strange bedfellows. Environmentally concerned protestors have been treating labor unions and poor countries as comrades in arms, proud of the fact that a disparate set of groups have supposedly been brought together by a shared opposition to globalization. But in fact, some of these groups are on the other side of the environmental issue. U.S. labor unions are strong opponents of the Kyoto Protocol on Global Climate Change. Poor countries tend to be strong opponents of international environmental agreements in general. Both groups cite national sovereignty in support of their positions. It is particularly puzzling that some environmentalists see pro-sovereignty supporters as natural allies, when so many environmental problems in fact need to be addressed by means of multilateral institutions that in fact infringe on national sovereignty.

If labor unions and environmentalists can come together on an issue, that is fine. *But they have to agree on that issue.* They should share something more than an emotional antipathy to some particular multilateral institution: they should want the institution to move in the same direction, not opposite directions. They don't have to get into fine details, if they don't want to. But if, for example, one group thinks that the proper response to globalization is that the multilateral institutions should exercise less invasion of national sovereignty in the pursuit of environmental regulation and the other thinks the institutions should exercise more invasion of national sovereignty in that pursuit, then they are in truth hardly allies.

International Agreements and Institutions

Those who live in the world of international trade negotiations respond to those who live in the environmentalist world along the lines that their concerns may be valid, but that they should address them by their own, separate, negotiations, and their own multilateral agencies.²⁹

²⁹ The most prominent and articulate spokesman of the viewpoint opposing linkage between trade and unrelated issues is Jagdish Bhagwati (2000).

Multilateral Environmental Organizations

The one multilateral organization dedicated to environmental issues in general, the United Nations Environmental Program, is universally considered small and weak, even by the standards of UN agencies. Some may favor beefing it up. Most feel that it is not fixable, that—to begin with—it would have to be based somewhere like Geneva in order to be taken seriously, not in Nairobi as now. On these grounds, some have proposed a new, powerful, multilateral World Environment Organization.³⁰ Daniel Esty (1994) has proposed that it be called the Global Environmental Organization, providing the appropriate acronym GEO. But the source of the problem is not some accident of bureaucratic design history or geography. The problem, rather, is that there is very little support among the world's governments for a powerful multilateral agency in the area of the environment. They fear infringement on their sovereignty.

One can say that in concentrating their fire on the WTO, environmental activists are adopting a strategy of taking the multilateral trading system hostage. They envy the relative success of the WTO system. They are aware that international environmental treaties, even if successfully negotiated and ratified, may be toothless. The agreements made at Rio de Janeiro in 1992 are an example. The activists would ideally like to adopt trade sanctions as a means of enforcement, as does the WTO itself.

Such proposals do not explain attempts to take globalization hostage more broadly, for example by demonstrations at WTO ministerial meetings. There is nothing in the WTO to block multilateral environmental treaties from adopting trade sanctions. Indeed, the Montreal Protocol on stratospheric ozone depletion has such sanctions, ran into no problems under international trade rules, and is generally considered to have been successful in achieving its goals. Admittedly that is a rare example. Most governments do not favor international environmental agreements that are so aggressive as to include trade sanctions. Again, the failure does not mean that globalization and global institutions like the WTO are the problem. More likely it is the other way around: globalization is the ally, and national sovereignty is the obstacle.

Bilateral and Regional FTAs

Regional and bilateral agreements, such as the European Union or the Australia-New Zealand Closer Economic Relationship, have incorporated environmental components more often than have multilateral agreements. Whether because of cultural homogeneity or the small numbers involved, a group consisting of a few neighbors is usually readier to contemplate the sort of “deep integration” required for harmonization of environmental standards than are negotiators in groups with more than 100 diverse members, such as the WTO.

In the public debate over the North American Free Trade Agreement, one of the most prominent concerns of opponents was the pollution that had already accompanied industrialization in northern Mexico, particularly among the maquilladoras along the border, which in turn was a result of the ability to trade with the United States. The final agreement departed from previous U.S. trade agreements, or those in most other parts of the world, by taking into account environmental concerns, at least in a small way. The preamble includes environmentally friendly language, such as a stipulation that the

³⁰ Charnovitz (2002b) surveys the proposals. Juma (2000) argues in opposition, on the grounds that decentralized agreements can do the job better.

NAFTA goals are to be pursued “in a manner consistent with environmental protection and conservation.” Chapter 7B allows the member countries to continue adopting sanitary and phyto-sanitary standards. Chapter 9 allows countries to set whatever environmental standards they want, provided only that they do not discriminate or discourage trade unnecessarily.³¹

Nevertheless, environmental groups were unhappy with the subsequent outcome. Proposed side-agreements, for example, to establish a bank to finance environmental clean-up along the border, received a lot of attention during Bill Clinton’s presidential campaign and during the subsequent NAFTA ratification campaign. Follow-up after the NAFTA went into effect in 1994, however, was disappointing.

Meanwhile, provisions under Chapter 11, which governs direct investment, have turned out to be important. On the one hand, the text reads “the Parties recognize that it is inappropriate to encourage investment by relaxing domestic health, safety or environmental measures.” On the other hand, protection of the rights of investors has confirmed some environmentalists’ fears, particularly a case brought by a Canadian company called Metalclad under the dispute settlement mechanism. Under a clause that forbids a signatory from taking measures “tantamount to nationalization or expropriation” of firms from other member countries, Metalclad in August 2000 won a judgment from a NAFTA tribunal against local Mexican regulators’ attempt to close its hazardous waste disposal plant without compensation. The finding that Mexican regulation had denied a foreign firm fair and equitable treatment was potentially an important precedent under the NAFTA.³² But it would be strange, even from a pro-business viewpoint, if an American or Canadian firm were extensively protected against regulatory “takings” in Mexico when it would not be in its country of origin.

The NAFTA experience reinforced environmentalists concerns with trade agreements. They urged the U.S. government to bring environmental issues inside trade negotiations, for example, forbidding parties in trade agreements from relaxing environmental regulation in order to seek competitive advantage. A preferential trading arrangement negotiated by the United States at the end of the Clinton Administration, the Jordan-U.S. free trade agreement, incorporated such environmental [and labor] provisions directly in the text, rather than as a side agreement, a precedent that was hoped to establish a “template” or precedent for future agreements. In addition, an Executive Order now requires that the government prepare an “environmental impact statement” whenever negotiating new trade agreements in the future, to guard against possible inadvertent side-effects adverse to the environment.³³

The WTO and Some Panel Cases

In the post war period, the vehicle for conducting the multilateral negotiations that succeeded in bringing down trade barriers in many countries was the General Agreement on Tariffs and Trade. An important outcome of the Uruguay Round of negotiations was

³¹ Hufbauer, Esty, Orejas, Rubio, and Schott (2000).

³² Ibid. pp. 8-14.

³³ The Executive Order was issued by President Clinton in 1999. But President George Bush announced he would continue to abide by it, e.g., in preparing possible free-trade agreements with Singapore, Chile, and the Americas. Martin Crutsinger, *AP* 4/21/2001 [e.g., *Boston Globe*].

the replacement of the GATT organization with a real agency, the World Trade Organization, which came into existence in 1995. One reason why the change was important is that the new institution featured a dispute settlement mechanism, whose findings were to be binding on the member countries. Previously, a party that did not like the ruling of a GATT panel could reject it.

Why do so many environmentalists apparently feel that the still-young WTO is a hostile power? Allegations concern lack of democratic accountability and negative effects on the environment. It is difficult to see how these allegations could apply to the process of setting WTO rules themselves. Regarding the alleged lack of democracy, the GATT and WTO are in principle one-country one-vote bodies that make decisions by consensus. Clearly in practice, some countries—particularly the United States—matter far more than others. But consider what it would mean to make this process more democratic. It would presumably mean giving less weight to U.S. views and more to the views, for example, of India, the world's most populous democracy. But, given India's preferences and its aversion to "eco-imperialism," this would clearly mean giving *less* attention in the WTO to environmental goals, not more.

The allegation that the GATT and WTO are hostile to environmental measures could conceivably arise from the core provisions of the GATT, which prohibit a member country from discriminating against the exports of another, in favor of "like products" made either by a third country (that is the Most Favored Nation provision of Article I) or by domestic producers (the national treatment provision of Article III). But Article XX allows for exceptions to the non-discrimination principle for environmental reasons (among others), provided that the measures in question are not "a means of arbitrary or unjustifiable discrimination" or a "disguised restriction on international trade." [Umbrella clauses allow countries to take actions to protect human, animal or plant life or health, and to conserve exhaustible natural resources.]

Under the GATT, there was ambiguity of interpretation as to what was to happen when Article XX conflicted with the non-discrimination articles. To clarify the matter, in the preamble of the articles agreed at Marrakech establishing the WTO, language was added specifying that its objectives were not limited to promoting trade but included also optimal use of the world's resources, sustainable development, and environmental protection. Environmental objectives are also recognized specifically in the WTO agreements dealing with product standards, food safety, intellectual property protection, etc.

The protests are in a sense a puzzle. It would be easy to understand a political campaign in favor of the WTO taking a more aggressive pro-environment stance. But how does one explain the common view in the protest movement that the WTO currently is actively harmful to the environment?

When members of the protest movement identify specifics, they usually mention the rulings of WTO panels under the dispute settlement mechanism. The panels are quasi-judicial tribunals, whose job is to rule in disputes whether parties are abiding by the rules that they have already agreed to. Like most judicial proceedings, the panels themselves are not intended to be democratic. The rulings to date do not show a pattern of having been dominated by any particular country or interest group. There have been three or four fairly prominent WTO panel rulings that concern the environment in some way. Most within the environmentalist and NGO community have at some point acquired the belief

that these rulings told the United States, or other defendant country, that their attempts to protect the environment must be repealed. The mystery is why this impression is so widespread, because it has little basis in fact.

The four WTO cases that will be briefly reviewed here are Canadian asbestos, Venezuelan reformulated gasoline, U.S. hormone-fed beef, and Asian shrimp and turtles. We will also touch on the Mexican tuna-dolphin case. Each of the cases involves an environmental measure that the producer plaintiff alleged to have trade-distorting effects. The complaints were not based, however, on the allegation that the goal of the measure was not valid, or that protectionism was the original motivation of the measure. In most of the cases, the allegation was that discrimination against foreigners was an incidental, and unnecessary, feature of the environmental measure.

Canadian Asbestos

One case is considered a clear win for the environmentalists. The WTO Appellate Body in 2001 upheld a French ban on asbestos products, against a challenge by Canada, who had been exporting to France. This ruling made real the WTO claim that its charter gives priority to health, safety and environmental requirements, in that for such purposes GATT Article XX explicitly allows exceptions to the Most Favored Nation and national treatment rules.³⁴

Venezuelan Reformulated Gasoline

In the reformulated gasoline case, Venezuela successfully claimed that U.S. law violated national treatment, i.e., discriminated in favor of domestic producers (with regard to whether refineries were allowed to use individual composition baselines when measuring pollution reduction). The case was unusual in that the intent to discriminate had at the time of passage been made explicit by U.S. administration officials seeking to please a domestic interest group. If the WTO had ruled in the U.S. favor, it would have been saying that it was fine for a country to discriminate needlessly and explicitly against foreign producers so long as the law came under an environmental label. Those who oppose this panel decision provide ready-made ammunition for the viewpoint that environmental activism is a false disguise worn by protectionist interests.

The United States was not blocked in implementing its targets, under the Clean Air Act, as commonly charged. Rather, the offending regulation was easily changed so as to be nondiscriminatory and thus to be permissible under the rules agreed by members of the WTO. This case sent precisely the right message to the world's governments, that environmental measures should not and need not discriminate against foreign producers.

Hormone-fed Beef

What happens if the commodity in question is produced entirely, or almost entirely, by foreign producers, so that it cannot be conclusively demonstrated whether a ban, or other penalty, is or is not discriminatory? The WTO has attempted to maintain the rule that such measures are fine so long as a scientific study has supported the claimed environmental or health benefits of the measure. In the hormone-fed beef case, the WTO ruled against an EU ban on beef raised with growth hormones because the EU

³⁴ *New York Times*, July 25, 2000.

conspicuously failed to produce a science-based risk assessment showing that it might be dangerous. It thus resembles the case of the EU moratorium on GMOs.

These are genuinely difficult cases. On the one hand, where popular beliefs regarding a scientific question vary widely, a useful role for a multilateral institution could be to rule on the scientific merits. Or, at least, a useful role could be, as under the current WTO procedures, to rule on whether the country seeking to impose the regulation has carried out internally a reasonable study of the scientific merits. This logic suggests overruling the EU bans. On the other hand, the world may not be ready for even this mild level of loss of national sovereignty. If a nation's intent is to protect its health or environment, even if the measure has little scientific basis and even if its primary burden would fall on foreign producers, perhaps ensuring that the ban does not unnecessarily discriminate among producing countries is the best that can be done.

Despite the WTO ruling on hormone-fed beef, the Europeans did not cancel the ban. Their strategy, which they justify with the name "precautionary principle," is to continue to study the matter before allowing the product in. The precautionary principle, as the Europeans apply it, says to prohibit new technologies that have not yet been proven safe, even if there is no evidence that they are dangerous.³⁵ [At a minimum, it seems that they should be forced to allow imports of American beef subject to labeling requirements, as in the Montreal agreement on GMOs.]

Shrimp-turtle

Perceptions regarding the WTO panel ruling on a dispute about shrimp imports and the protection of sea turtles probably vary more widely than on any other case. The perception among many environmentalists is that the panel ruling struck down a U.S. law to protect sea turtles that are caught in the nets of shrimp fishermen in the Indian Ocean. (The provision was pursuant to the U.S. Endangered Species Act.) In reality, the dispute resembled the gasoline case in the respect that the ban on imports from countries without adequate regulatory regimes in place was unnecessarily selective and restrictive. The WTO panel and appellate body decided that the US application of the law, in a complex variety of ways, was arbitrarily and unjustifiably discriminatory against the four plaintiff countries (Asian shrimp suppliers). The U.S. had unilaterally and inflexibly banned shrimp imports from countries that did not have in place for all production a specific turtle-protection regime of its own liking, one that mandated Turtle Excluder Devices.³⁶

³⁵ Does the precautionary principle derive from risk aversion? Someone should point out that risk-aversion in the presence of uncertainty is not necessarily sufficient to justify it. For poor residents of developing countries, the risk may be higher from drought or pests or disease in their crops, or from existing pesticides, than from the new GMOs that are designed to combat them more safely. Does the precautionary principle say that society should persist with what is natural and traditional, even if the current state of scientific evidence suggests a better, artificial, substitute? Then Asian men concerned about maintaining virility should continue to buy powdered rhino horn rather than switching to Viagra. (Gollier, 2001, offers another economist's perspective on the precautionary principle.)

³⁶ For example, the Asian suppliers had been given only four months' notice, thus discriminating against them and in favor of Caribbean suppliers. [The US measure has also been pronounced unnecessarily restrictive in another sense: the majority of suppliers in India raise shrimp by aquaculture, where no sea turtles are endangered. Jagdish Bhagwati, *Financial Times*, December 21, 1999.]

The case could in fact be considered a victory for the environmentalists, in that the WTO panel and the appeals body in 1998 explicitly stated that the U.S. could pursue the protection of endangered sea turtles against foreign fishermen. The United States subsequently allowed more flexibility in its regulation, and made good-faith efforts to negotiate an agreement with the Asian producers, which is what it should have done in the first place. The WTO panel and appellate body in 2001 found the new U.S. regime to be WTO-compliant.³⁷ The case set a precedent in clarifying support for the principle that the WTO rules allow countries to pass judgment on other countries' Processes and Production Methods, even if it means using trade controls to do so, provided only that the measures are not unnecessarily discriminatory.³⁸

Tuna-dolphin

In an earlier attempt to protect another large flippered sea animal, the United States (under the Marine Mammal Protection Act) had banned imports of tuna from countries that allowed the fishermen to use nets that also caught dolphins. Mexico brought a case before the GATT, as this pre-dated the WTO, and the GATT panel ruled against the U.S. law. Its report was never adopted. The parties instead in effect worked out their differences bilaterally, "out of court." The case could be considered a setback for trade-sensitive environmental measures, at least unilateral ones, but a setback that was to prove temporary. That the GATT ruling in the tuna case did not affirm the right of the U.S. to use trade bans to protect the dolphins shows how much the environmentalist cause has progressed under the WTO, in the subsequent gasoline, shrimp-turtle, and asbestos cases.

A system for labeling tuna in the U.S. market as either "dolphin safe" or not was later found consistent with the GATT. The American consumer response turned out to be sufficiently great to accomplish the desired purpose. Since 1990, the major companies have sold only the dolphin-safe kind of tuna. The moral is not just that the goal of protecting the dolphins was accomplished despite globalization in its GATT incarnation. The moral is, rather, that *globalization was instrumental in the protection of the dolphins*. The goal could not have been accomplished without international trade, because American citizens would have had no effective way of putting pressure on Mexico. Leaving the U.S. government free to regulate its own fishermen would not have helped.³⁹

³⁷ Charnovitz (2002a, p. 98-99).

³⁸ For a full explanation of the legal issues, see Charnovitz (2002a). Also Michael Weinstein, "Greens and Globalization: Declaring Defeat in the Face of Victory," *NY Times*, April 22, 2001. Charnovitz and Weinstein (2001) argue that the environmentalists fail to realize the progress they have made in recent WTO panel cases, and may thereby miss an opportunity to consolidate those gains. It is not only environmentalists who are under the impression that the GATT rules do not allow PPMs. Some developing countries also claim that PPMs violate the GATT. The motive of the first group is to fight the GATT, while the motive of the second group is to fight PPMs.

³⁹ Thomas Friedman, *New York Times*, p. A31, December 8, 1999. Presumably, in the absence of the opportunity to export to the US, Mexican fisherman would not have caught as many tuna for the domestic market alone, which would have limited the dolphin casualties somewhat. It is not known whether the much-reduced number of dolphins still killed under the current system is less than in the hypothetical no-trade case. But working through the channel of voting power represented by U.S. imports was surely a better way to have accomplished the goal. Telling Mexican fisherman they must remain poor, and telling

Multilateral Environmental Agreements

When it comes to global externalities such as endangered species, stratospheric ozone depletion, and global climate change, it is particularly clear that the problem cannot be addressed by a system where each country pursues environmental measures on its own. Multilateral negotiations, agreements, and institutions are required. Furthermore, the point is not simply that global regulatory measures are needed to combat the effects of economic globalization. If countries had industrialized in isolation, without any international trade or investment among them, they would still be emitting greenhouse gases, and we would still need a globally coordinated response.

Multilateral environmental agreements (MEAs), even if they involve trade-restricting measures, are viewed more favorably under the international rules than unilateral environmental measures. Leaving aside the Law of the Sea, the Basel Convention on Hazardous Wastes, and a large number of relatively more minor agreements, three MEAs merit particular mention.

The Convention on International Trade in Endangered Species (CITES) was negotiated in 1973. Although it lacks the teeth that many would like, it was notable as a precedent establishing that MEAs are compatible with the GATT even if they restrict trade.

The Montreal Protocol on Substances that Deplete the Ozone Layer is the most successful example of an MEA, as it has resulted in the phasing out of most use of CFCs (Chlorofluorocarbons) and other ozone-depleting chemicals. The success of this agreement is partly attributable to the enforcement role played by trade sanctions: the protocol prohibits trade in controlled substances with countries that do not participate. This created the necessary incentive to push those developing countries that otherwise might have been reluctant into joining. If substantial numbers of countries had nevertheless remained outside the Protocol, the trade sanctions would have also accomplished the second objective—minimizing *leakage*, that is, the migration of production of banned substances to non-participating countries.⁴⁰ The Protocol was helped to succeed in that there were a relatively small number of producers. It also helped that there turned out to be good substitutes for the banned substances, though that was not known until the ban was tried.⁴¹ The Protocol also worked to bolster the principle that PPMs were not necessarily incompatible with the GATT, in that the agreement threatened non-participants not only with a ban on trade in ozone-depleting chemicals themselves, but also a potential ban on trade in goods manufactured with such chemicals.

The Kyoto Protocol on Global Climate Change, negotiated in 1997, is the most ambitious attempt at a multilateral environment agreement to date. This is not the place to discuss the Kyoto Protocol at length. The task of addressing Climate Change while satisfying the political constraints of the various factions (particularly, the U.S., EU, and developing countries) was an inherently impossible task. Most economists emphasize that

American consumers that they couldn't eat tuna, would have been a less satisfactory solution to the problem.

⁴⁰ Brack (1996).

⁴¹ Parson (2002).

the agreement as it was written at Kyoto would impose large economic costs on the United States and other countries, while making only a minor dent in the problem. The Clinton Administration's interpretation of the Protocol insisted on so-called flexibility mechanisms, such as international trading of emission permits, to bring the economic costs down to a modest range.⁴² This interpretation was rejected by the Europeans at the Hague in November 2000. Without the flexibility mechanisms, the United States would be out of the Protocol, even if the subsequent administration had been a more environmentally friendly than it was. (Ironically, now that European and other countries are trying to go ahead without the United States, they are finding that they cannot manage without such trading mechanisms.)

Even most of those who for one reason or another do not believe that Kyoto was a useful step, however, should acknowledge that multilateral agreements will be necessary if the problem of Global Climate Change is to be tackled. The current U.S. Administration has yet to face up to this. The point for present purposes is that a system in which each country insists, based on an appeal to national sovereignty, that it be left to formulate environmental policies on its own, would be a world in which global externalities like greenhouse gas emissions would not be effectively addressed.

Summary of Conclusions

The relationship between globalization and the environment is too complex to sum up in a single judgment—whether “good” or “bad.” In many respects, global trade and investment operate like other sources of economic growth. They tend to raise income as measured in the marketplace. On the one hand, the higher scale of output can mean more pollution, deforestation, and other kinds of environmental damage. On the other hand, changes in the composition and techniques of economic activity can lower the damage relative to income. Although it is not possible to generalize universally about the net effect of these channels, it is possible to put forward general answers to some major questions.

- A key question is whether openness to international trade undermines national attempts at environmental regulation, through a “race to the bottom” effect. This no doubt happens sometimes. But there is little statistical evidence, across countries, that the unfavorable effects on average outweigh favorable “gains from trade” effects on measures of pollution, such as SO₂ concentrations. If anything, the answer seems to be that favorable effects dominate.

⁴² The author was one of the few economists sympathetic to the Clinton Administration policy on the Kyoto Protocol. Two claims: (1) Quantitative targets a la Kyoto are the “least impossible” way politically to structure an international agreement (see Frankel, 2003, for my response to the arguments of Cooper, 1998, Nordhaus, 2001, and Schelling, 2002, against assignment of quantitative targets). And (2) Bill Clinton's approach—signing the treaty but announcing his intention not to submit for ratification unless the Europeans agreed to unrestricted international trading of emission permits and unless developing countries agreed to participate in the system—was the least impossible way, subject to the existing political constraints, of demonstrating U.S. willingness to address climate change. It was our hope that when the world is ready to make a more serious attempt, it will build on the good aspects of the Kyoto Protocol, particularly the role for international permit trading and other flexibility mechanisms.

- Perceptions that WTO panel rulings have interfered with the ability of individual countries to pursue environmental goals are poorly informed. In cases such as Canadian asbestos, Venezuelan gasoline, and Asian shrimp, the rulings have confirmed that countries can enact environmental measures, even if they affect trade and even if they concern others' Processes and Production Methods (PPMs), provided the measures do not unnecessarily discriminate among producer countries.
- People care both about the environment and the economy. As their real income rises, their demand for environmental quality rises. Under the right conditions, this can translate into environmental progress. The right conditions include democracy, effective regulation, and externalities that are largely confined within national borders and are therefore amenable to national regulation.
- Increasingly, however, environmental problems do in fact spill across national borders. The strongest examples are pure global externalities such as global climate change and ozone depletion. Economic growth alone will not address such problems, in a system where each country acts individually, due to the free rider problem. International institutions are required. This would be equally true in the absence of international trade. Indeed, trade offers a handle whereby citizens of one country can exercise a role in environmental problems of other countries that they would otherwise not have. Consumer labeling campaigns and corporate codes of conduct are examples.
- Many aspects of the environment that might have been considered purely domestic matters in the past, or that foreign residents might not even have known about, are increasingly of concern to those living in other countries. This again means that multilateral institutions are needed to address the issues, and expressions of national sovereignty are the obstacle, not the other way around. Indeed, if one broadens the definition of globalization, beyond international trade and investment, to include the globalization of ideas and of NGO activities, then one can see the international environmental movement as itself an example of globalization.

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Fig. 1

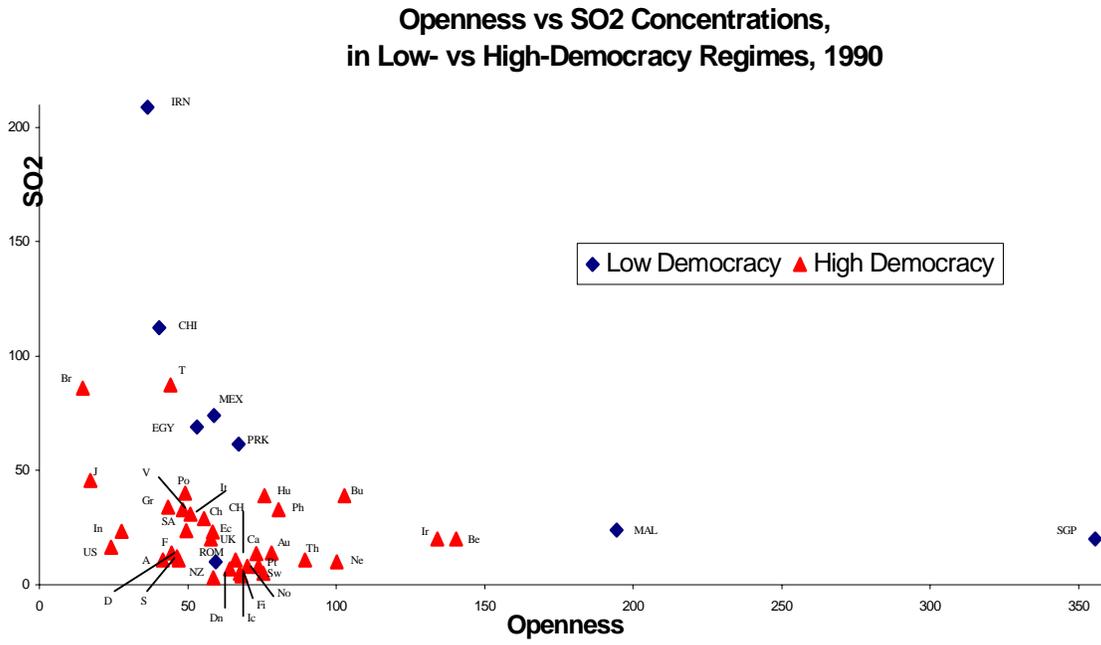


Fig. 2: THE IMPOSSIBLE TRINITY OF GLOBAL ENVIRONMENTAL REGULATION

