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Trade Liberalization and Environmental Quality: Opposing Viewpoints, Additional Issues, and the Necessity of Intervention

John R. Ubben

ABSTRACT. International trade, while promoting economic growth and development, is one of many suspects contributing to excessive rates of environmental degradation. Free trade compromises environmental quality in favor of welfare improvements and economic prosperity. The difficulty of measuring environmental amenities, trade theory's inability to address externalities and decisions overtime, and numerous market failures regarding socially optimal prices, serve as red flags requiring intervention. The most successful form of intervention is domestic policies that internalize externalities. Intervention is also necessary to balance the interests of environmentalists and free traders and to ensure that the gains from trade are devoted to environmental protection.

"We ought to move to the objective of allowing our state to become number one, not in the protection of toxic substances, but in the prosecution of those who are polluting our environment." Dan Morales, Texas State Legislator (D) Oct., 1990

Introduction

International trade has become one of President Clinton's primary strategies for continued domestic economic growth. The signing of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) on April 15, 1994 was done with the objectives that the agreement would create jobs in the U.S., improve the international competitiveness of U.S. industries, contribute to economic growth, and in general improve the standard of living of U.S. citizens [Executive Summary, 1994, ES-1]. Environmentalists, who have until recently conducted their work separately from trade-policy makers, argue that the agreement designed to promote international trade compromises environmental quality. At the other end of the spectrum, free traders believe that trade barriers need to be further reduced to improve economic welfare and that trade liberalization actually benefits the environment. Each side presents convincing evidence to support its claims. As is the case with most disputes, the best solution lies somewhere in the middle.

This paper attempts to address the effects that environmental regulations have on trade and trade liberalization's impact on

environmental quality. In addition, evidence will be provided to support the claim that there are efficiency concerns underlying the concept of trade liberalization that require some form of intervention to correct. Other issues such as the role that population and income growth plays in environmental degradation, international commodity agreements, and correcting for the limitations of trade theory are also addressed.

Sources of Conflict

There are many factors that have led to the conflict between international trade policy and environmental quality. Perhaps the greatest cause of the clash between the two is the increased attention now given to environmental issues. A Wall Street Journal / NBC News poll conducted in 1991 found that 8 out of 10 Americans consider themselves environmentalists [Esty, 1994, 10]. Americans in general are simply more aware of environmental issues, some for the right reasons and others because of the sensationalist doomsday predictions reported in the news media. Awareness is warranted, however, because environmental degradation in lesser-developed countries has increased drastically over the past twenty years [Lopez, 1992, 1138]. Because of its increased popularity, politicians pay greater attention to this issue. Members of Congress are also monitored by an organization called the League of Conservative Voters that rates politicians on the progress they make on environmental issues [Esty, 1994, 10].

A second, more theoretical reason for the disagreement between trade policy and environmental quality is the failure of policy-makers on two issues. First, politicians worldwide have failed to enact legislation that internalizes environmental costs, which would make consumers and producers pay the socially optimal price for the pollution they cause. Second, lawmakers have been sidetracked by special interest groups as each one attempts to swing legislation on trade in their favor [Esty, 1994, 4]. A related issue is the lack of understanding of how trade rules affect the environment and GATT's previous inability to clearly determine environmental issues [Whalley & Hamilton, 1996, 97]. "This reflects the fact that the norms and institutions of international trade remain rooted in the pre-environmental era and that there exists no international regime to protect ecological values to reconcile competing goals and priorities" [Esty, 1994, 4].

Lastly, the conflict is the result of a dispute over the relative scientific

importance of environmental issues the world faces. For example, if one were to believe the upper level estimates that climate change would have on the world economy, reducing world GDP by 20%, then sacrificing gains from free trade over the same time period would be a minor cost in preventing climate change. On the other hand, if one assumes the likelihood of climate change to be zero, then interfering with trade is not justified based on climate change [Esty, 1994, 41].

Goals and Concerns of Free Traders

The basic goal of trade negotiators is to lower trade barriers to increase economic welfare. They realize that the benefits from trade liberalization are scattered over many different groups, but in general results in lower prices, increased choices, and possible export opportunities in the future [Esty, 1994, 36]. Free traders also believe that trade liberalization will promote economic prosperity. This will create additional resources that can be devoted to environmental protection.

The greatest fear of those promoting free trade is that environmental regulations will serve as a new form of protectionism resulting in lost economic opportunities. Free traders believe that trade restrictions based on environmental policies will prevent foreign producers from entering new markets and therefore decrease the efficiency gains from trade [Esty, 1994, 12]. Free traders also worry that reliance on trade restrictions to further environmental protection will have economic costs that exceeds the benefits [Esty, 1994, 38]. They also fear that groups other than environmentalists will use environmental regulations to safeguard market positions and to extract monopoly rents. An example of this took place in February of 1994 when French officials held up the import of fresh fish due to health inspections. The inspections did little to protect public health or the environment, but French fishermen gained from the rejection of lower-cost imports [Esty, 1994, 45]. Labor unions in the U.S. are also quick to support protection based on working conditions in other countries, serving to reduce competition from lower wage countries [Whalley & Hamilton, 1996, 102].

Free traders disagree with efforts to control for differences in environmental standards to compensate countries with higher standards for a reduction in competitiveness due to higher compliance costs. They believe that this will eliminate comparative advantages which are the basis for economic gains from trade [Esty, 1994, 2]. Free traders also feel

that the use of trade restrictions to promote environmental issues will be done unilaterally, resulting in the collapse of an already delicate trade balance [Esty, 1994, 2]. The primary disagreement with environmentalists is that once environmental regulations are in place, they may be set in stone because government officials will be afraid to change them for fear of being labeled anti-environment. The fundamental issue, then, is being able to distinguish between environmental regulations that distort trade but promote legitimate environmental concerns from those that distort trade and have little or no impact on the environment [Harold & Runge, 1993, 789].

The Environmentalists' View

Environmentalists view trade liberalization as an invitation for increased pollution, the loss of one's own standards, and policies that are made by absent, unaccountable, business-driven politicians. Environmentalists feel that the rules of international trade have not caught up with the fact that the environment knows no political boundaries [Esty, 1994, 18]. Because of this, environmentalists put great emphasis on public participation in decision making so that business interests do not dominate the process. Environmentalists benefit from the broad review of environmental issues allowing them to gain strength and to affect trade decisions [Esty, 1994, 36].

A basic claim of many environmental groups is that lower environmental standards elsewhere will strengthen the business argument over competitive disadvantage, which will have a significant impact on the stringency of new environmental laws. Free trade will essentially mean losing one's own standards [Esty, 1994, 23]. According to Jagdish Bhagwati, the only choice environmentalists see is between having free trade without prior agreement on environmental standards which will lower U.S. standards, or forcing foreign standards to reach acceptable levels before trade takes place [1993, 45]. Environmentalists fear that industries will try to externalize pollution costs to improve their position relative to the competition. In this regard, environmentalists disapprove of economic growth because it fails to recognize the costs of environmental degradation and the incentive to avoid internalizing them [Esty, 1994, 36-37]. "In fact, in the absence of regulation, producers have incentive not to handle their own waste but to send them up a smokestack or out an effluent pipe, externalizing costs they would otherwise have to

bear” [Esty, 1994, 46].

The environmentalist camp is split on the issue of sustainable development. Some environmentalists subscribe to the notion of “limits to growth” and are opposed to economic development and therefore to almost all forms of trade. The other faction accepts sustainable development and sees economic growth as positive, as long as it is accomplished in environmentally friendly ways. This group seeks to secure gains from trade for environmental purposes and implement environmental standards to ensure that free trade is sustainable [Esty, 1994, 61].

Environmentalists opposed to trade argue that in the short run, free trade will increase pollution because of the increased economic activity it creates. The bottom line for these environmentalists is based on what are called scale effects. Specifically, trade generates wealth that enables individuals to consume more goods as well as nonrenewable and renewable resources well above their natural regenerative rates. Damage can also result from increased production. For example, NAFTA created the possibility for increased manufacturing facilities in Mexico, increasing the environmental stress near the U.S.-Mexico boarder [Esty, 1994, 43].

Environmentalists also argue that trade liberalization carries with it market entry agreements that force environmental regulations to take a back seat. The trade-off in this regard is between the easy access to foreign markets allowing producers to achieve scale economies (reduced prices for consumers) and the ability of individual countries to design environmental regulations suited to its own unique conditions. For example, each country will want to take into consideration factors such as climate, weather patterns, population growth, aversion to risk, and existing pollution levels before it makes a decision on the level of environmental standards [Esty, 1994, 43].

In a stride toward harmonization, environmentalists want to be able to use trade restrictions as a means to address cross-boundary pollution and to enforce international environmental agreements [Esty, 1994, 203]. Jagdish Bhagwati warns of the dangers of harmonization. Harmonization contradicts the very objective that environmentalists want to achieve, the freedom to set one’s own environmental standards. Bhagwati argues that harmonization ignores the idea that a nation must make environmental decisions that reflect economic conditions and social preference within its boundaries. “We should not ask of others what we would not accept

from them” [Bhagwati, 1993,45].

Common Ground

Environmentalists and free traders do share some common ground on two issues. Both groups believe that environmental quality and trade policy can coexist by making sure that environmental resources are optimally priced. Environmentalists take stock in the importance of cost internalization laid out by economists. Greater education has led to the understanding of the polluter-pays principle and the potential it has for making trade and environmental policies compatible [Esty, 1994, 38].

Environmental Regulations’ Affect on Trade

When considering whether trade harms or helps the environment, one must also examine the other side of this coin. Do environmental regulations have an effect on international trade? In 1992, world trade in merchandise and services reached \$4.7 trillion and was a primary force in the increase of global output [Esty, 1994, 20]. In the U.S. alone, every billion dollars of national export creates approximately 14,500 jobs. Americans also lose an estimated \$70 billion annually due to trade barriers. With respect to environmental quality, the question remains: will trade barriers based on environmental protection decrease the \$270 billion expected global gains from trade liberalization approved at the Uruguay Round? [Esty, 1994, 20].

According to Duncan Brack, who acknowledges the fact that efforts to protect the environment may create trade barriers, a reduction in gains from trade resulting from environmental regulations may be true only in the short run. He suggests that over a period of time the regulations may change direction and strength as they are amended to keep pace with changes in understanding [Brack, 1998, 48]. As a qualification to this finding, most studies have only researched short-term effects. More research needs to be done on the long run effects of environmental policies. Other models found that the conflict between trade and environmental policies, including those where lower standards exist, suggest that overall global economic performance will only be slightly restricted [Whalley & Hamilton, 1996, 93]. For example, Low conducted a study in 1992 that looked at pollution abatement costs incurred by U.S.

domestic industries and the potential effects on Mexican exports to the U.S. were the U.S. to levy special import taxes to offset these costs. Low concluded that the trade impacts are small. "His study shows that U.S. industry's pollution control expenditures represent only a small component of total costs, with only 18 of 123 industries paying more than 1% of the value of their output" [Whalley & Hamilton, 1996, 91]. Thus the impact of such a tax would be small, reducing Mexico's exports by less than 2% [Whalley & Hamilton, 1996, 91].

Researchers have failed to explore the impact that wide-ranging environmental regulations such as a global carbon tax might have. Studies conducted by Whalley and Wigle (1991) and Piggot, Whalley, and Wigle (1992) found that carbon taxes could have a large effect on international trade [Whalley & Hamilton, 1996, 92]. "The presence of large carbon taxes which apply to a significant input component feeding through to manufacturing is large. The result is a potential major impact on international trade in manufactures and changes in trade patterns" [Whalley & Hamilton, 1996, 92]. At the extreme, global carbon taxes could completely stop the growth in world trade and reverse the trend trade liberalization has helped to create in the last 40 years [Whalley & Hamilton, 1996, 93].

Population and Income Growth

To qualify the discussion on trade's impact on the environment, it is first important to examine the affects that population and income growth has had on pollution. Logic would lead one to believe that an overall increase in population would be a major cause of environmental degradation and it probably is. However, it is worth noting that recent studies seems to indicate the opposite in certain regions of the world. Through the econometric analysis of 54 tropical countries, Burgess found a negative relationship between population growth and deforestation [Lutz, 1992, 1155]. The explanation for this counter-intuitive finding is that resource conservation practices are labor intensive in highland and tropical regions. "A study by Garcia-Barrios and Garcia-Barrios in the state of Oaxaca, Mexico, and another one by Collins in Puno, Peru, concluded that a major source of environmental degradation and agricultural productivity loss has been insufficient rather than excessive population growth" [Lopez, 1992, 1140]. This phenomenon is common only in the

highlands of Latin America; these effects have not been recorded anywhere else [Lopez, 1992, 1140].

The other factor often linked to environmental degradation and pollution is a country's level of income. Here the relationship is not so clear. At the extremes, it seems that countries that are relatively either extremely wealthy or poor pollute the least, while developing countries stuck in the middle tend to have the highest levels of pollution. There is empirical evidence to support the claim that rich countries can afford and do have higher environmental standards that in general raise the quality of air and water. The point is that environmental quality is a luxury good, with a high income elasticity.

Trade Liberalization Benefits the Environment

How might trade liberalization help the environment? Trade liberalization can benefit the environment in a number of ways. Free trade can promote the transfer of genetic material and technology that can improve agricultural development and environmental protection in the form of a reduction in chemical use. Trade liberalization can also help improve the efficiency of resource allocation by removing inefficient prices and subsidies. Trade also encourages environmentally sustainable use. Finally, trade can be argued to be a key factor in the increase in environmental standards and increase the speed with which developing countries reach the environmental stage because it serves to increase income [Brack, 1998, 1, 14].

In the area of biotechnology, the transfer of biological pest controls, such as predator organisms and genetically developed crops resistant to disease and insects, can reduce the dependence on chemicals. In agriculture, the transfer of farming practices such as crop rotation and low till or no till farming, can be instrumental in developing sustainable agriculture practices and reducing soil erosion in lesser-developed countries [Zilberman, 1992, 1145]. Trade liberalization may also serve to break down exchange rate policies that subsidize the importation of chemicals. Hence, free trade could reduce chemical usage and lead to environmental improvement [Antel, 1993, 784].

Trade liberalization can help improve resource allocation by removing inefficient prices. Trade liberalization can improve resource allocation by allowing countries to specialize in the production of goods and services in which they are most efficient. Efficiency allows a country

to maximize its output for a given level of resources. It can be argued that the efficient allocation of resources is a step toward environmentally sustainable development [Brack, 1998, 1]. If an allocation is Pareto optimal, then there are no other allocation of resources that could make one group better off without hurting any other group. As long as environmental quality is taken into consideration when resources are allocated, then, in theory, trade that promotes efficiency will benefit the environment.

Trade can also serve to increase environmental standards in the manufacturing sector. Companies who produce goods for export face a number of different standards, some higher than others. It is simply easier and more cost effective to produce products to meet the highest standards, so when the company looks to expand into new markets it will have the advantage of already complying with standards regarding the environment, labeling, safety, and many other factors [Brack, 1998, 14].

An increased rate of growth of income caused by trade can help promote environmental quality. Increased income creates potential for investment in environmental protection and may also speed up the transition from purely economic concerns to a balance of environmental and economic growth for developing countries [Antel, 1993, 787]. However, this link is not automatic and policies will need to be implemented to ensure environmental concerns are pursued simultaneously. "Poverty per se is a form of environmental degradation and thus economic well-being is an environmental plus, regardless of its effect on pollution control or environmental protection efforts" [GATT Secretariat, Esty, 1994, 64].

The study performed by Perroni and Wigle (1994) is most often cited for the lack of impact trade restrictions, and therefore trade, have on the environment and the type of intervention most successful in promoting environmental protection. The authors attempted to assess international trade's relationship to environmental degradation by examining the effects on environmental quality and welfare of the following environmental policies: 1) Business as usual (current environmental protection levels). 2) A move to full global internalization meaning, that the internalization rate for the domestic and international components of environmental externalities is 1 or 100%. 3) Unilateral domestic environmental action by North America, meaning that the internalization rate for the domestic component of environmental externalities was 1 or 100% in North America. The authors also examined three trade-policy

scenarios: 1) benchmark trade barriers; 2) a removal of all trade barriers (free trade); 3) a three-fold increase in trade barriers (trade wars).

Environmental damage was measured locally in terms of emissions summed for all sectors in a region, and globally by summing all sectors in all regions. “The relationship between emissions experienced and environmental damage is modeled by means of convex, constant elasticity damage function:

$$D^L(E^L) = k^L(E^L)^{p^L}$$

$$D^G(E^G) = k^G(E^G)^{p^G}$$

Where D = environmental damage
 E^L & E^G are the sum of net local and global emissions
 k^L & k^G are constants
 p^L & p^G represent elasticities of damage with respect to emissions (assumed to be greater than 1)” [Perroni & Wigle, 1994, 552-558].

Environmental quality was then modeled on the consumption side of the economy as the difference between endowments of environmental quality and damage. A utility function described by consumption goods and environmental quality was used to measure individual valuations of environmental quality. Environmental policies were described in the model using emission fees that internalized some or all of the external costs associated with emissions. The revenue from these taxes went to the residents of the country where the emissions took place [Perroni & Wigle, 1994, 552-558].

The primary factors of production and trade were labor and capital, which were modeled as domestically mobile but internationally immobile. In the model, this prevented dirty industries from moving to regions with lower emission taxes. Finally, six goods were chosen, representing both industries having high emission levels and those with low levels, as well as high technology and low technology industries. These goods were also identified by their intensities related to labor, skills, capital, and environmental inputs. Countries were then grouped together by their per capita income level and their environmental quality relative to one another [Perroni & Wigle, 1994, 552-558].

By examining trade in these products, environmental damage caused by their production, and environmental policies crossed against each trade-policy scenario, the researchers drew important conclusions on the

relationship between trade and the environment. At the benchmark level of the trade-policy scenario, international trade had a small adverse effect on environmental quality. The removal of all trade barriers resulted in a slight worsening of environmental quality, while a three-fold increase in trade barriers had only a small positive impact on the environment [Perroni & Wigle, 1994, 561-562].

The welfare effect on different regions tells a much different story. Trade liberalization had the greatest benefit for the U.S., Canada, and other developed countries, while the remaining regions saw small or no gains. However, trade regulations/barriers had a substantial negative effect on welfare for all regions. Other results showed that all regions had more than a 39% improvement in environmental quality when externalities were fully internalized regardless of the trade-policy scenario. On the other hand, environmental quality improvements were never more than 2% when trade barriers were used to address environmental issues. The conclusion is that the trade policies of different regions in the study (benchmark, free trade, trade wars) had very little impact on environmental quality compared to the effects of environmental policies (business as usual, global internalization, unilateral NA action) [Perroni & Wigle, 1994, 563]. This suggests that international trade's impact on environmental quality is modest at best.

Other conclusions can be drawn from this study. When developed regions practiced domestic internalization, improvements in environmental quality resulted for all regions. However, the addition of trade restrictions based on environmental concerns had no added effect on environmental quality. This supports the fact that environmental policies need not be accompanied by trade barriers [Perroni & Wigle, 1994, 563].

This model has a few limitations. There is a limited knowledge on how emissions affect the environment, and the model does not take into consideration the damage caused by the consumption of goods. The fact that perfect competition was used and capital mobility was limited adversely affected the impact of both trade and environmental regulations. The authors suggest that environmental achievements made via trade barriers are likely to be smaller than the amount predicted because world production has a small trade component. Trade in environmentally safe goods is already prevalent, and even for some pollution intensive goods the cost of abatement is sometimes included in total costs [Perroni & Wigle, 1994, 566].

Trade Liberalization Damages the Environment

The effects trade liberalization has on the environment are difficult to predict. Lopez argues that free trade only serves to bring domestic prices more in line with world prices and there is no reason to believe that one set of prices is better for the environment than the other [1992, 1141]. Then there are those who argue that international trade has a negative effect on environmental quality. Some suggest that free trade can result in the expansion of agricultural production on to highly erodible, more marginal land, increase unsustainable economic activity, disrupt the traditional institutions of the world's poor, and result in the specialization of capital intensive activities. In addition, trade liberalization can create changes in the domestic terms of trade and cause nations to be used as dumping grounds.

Trade liberalization can serve to promote unsustainable patterns of economic development if environmental externalities are not factored into prices or the decision-making process. The result is increased pollution and the depletion of the country's natural resources [Brack, 1998, 2]. A related point is that without express environmental protection, trade rules set multilaterally will tend to neglect environmental issues that arise during the time between economic growth and increased environmental protection, as well as overlook differences in each country's individual effort to achieve environmental sustainability [Esty, 1994, 64, & Brack, 1998, 2].

As discussed earlier, the transfer of technology in the biotechnical field can benefit countries. However, there is a downside to such trade. In some cases, transferred species have had a negative impact on the local environment. Examples of this include rabbits in Australia, and more recently a beetle from China that has made its way to the U.S., via imported wood products, that has killed many trees in a number of U.S. cities. Some agricultural practices and crops have also been found inappropriate for certain regions of the world [Zilberman, 1992, 1145].

Many economists have hypothesized that one of the major causes of forest biomass and soil depletion is poverty. Lopez, rather, believes that it is the disruption of traditional institutions and practices of the poor that is the main cause of rural environmental degradation [1992, 1138]. The world's rural poor are extremely dependent upon the natural environment to survive. Many have no choice but to consume natural resources.

Lopez believes that free trade can result in the collapse of traditional practices increasing environmental degradation and trapping the rural poor in a cycle of poverty [1992, 1138].

How does free trade lead to institutional collapse? Studies conducted in Asia and Latin America conclude “displacement and loss of entitlements to resources originated in factors external to the community” [Lopez, 1992, 1139]. Large-scale agriculture and export-oriented forestry were among the most frequently mentioned external factors. Stonich uses the example of Southern Honduras in the 1960’s and 70’s to demonstrate this effect. During this time booming commodity prices drove an increase of exported-oriented agricultural products. This process was accomplished by investments in infrastructure and the extension of credit subsidies. The result was a major reallocation of land from either forests or production of food crops to pasture for livestock or production of export crops. Many small farmers lost their land both by legal and illegal means to make room for the land-intensive commercial livestock and crops, and were forced to work as farm hands on the land they once owned [Lopez, 1992, 1139].

When commodity prices fell, the landless farmers, who faced lower employment and wages, were forced to return to self-sufficient means of survival. However, the extreme degradation of once previously productive farmland by commercial practices forced peasants to operate on hilly lands that were more marginal. “This in turn creates a second wave of environmental destruction, as a large number of peasants were displaced toward forests and other more marginal areas” [Lopez, 1992, 1139]. This is a good example of how free trade encouraged a country to take advantage of high commodity prices in the short run and create extensive environmental damage during and after commercial practices were no longer profitable. Two factors besides free trade contributed to environmental degradation and the loss of traditional practices of the rural poor. First, the Honduran legal system failed to enforce property rights, which may have also contributed to the disruption of traditional practices. Second, the government’s investment in infrastructure and the extension of credit subsidies also facilitated the process.

The argument opposing Lopez’s view is that the same traditional institutions and practices of the rural poor that protect the environment keep people poor. It is important to distinguish support for the protection of the environment through traditional practices from the support of traditional institutions in order to keep people poor to benefit other groups

through tourism and higher commodity prices. One must also take into consideration the values, beliefs, and attitudes of these groups. For some, their families have been farming and using the land in the same way for centuries in order to survive. Perhaps they view living in harmony with the land and the natural environment as a rich and fulfilling way of life and preserving it for future generations as their duty. Many did not consider themselves poor until greedy “westerners” began to impose their standards of rich and poor on them. Before labeling an individual poor or rich, one needs to consider not only relative and absolute definitions of poverty, but also the culture and history of the individual.

Being realistic however, few will find a solution to the dilemma that the traditional institutions, while protecting the environment, keep rural people in lesser-developed countries poor because that’s how some people want to live. The fact that the world is becoming one large market place also makes it a lot easier for lesser-developed countries to adapt the standards of rich and poor that Western and other developed countries have. A possible solution may lie in new international commodity agreements, which will be discussed later.

Finally, trade liberalization can result in specialization in capital intensive activities. Countries are attracted to the prospect of rapid economic growth, which can result from capital accumulation. Capital-intensive regions tend to have higher productivity growth rates than the more traditional labor-intensive regions. According to Lopez, “countries have two basic mechanisms to increase the profitability of capital, (i) compressing real wages in the short run through various direct and indirect means (indirect means such as investment subsidies, and the provision of specific infrastructure to reduce capital costs that are financed out of general taxation are probably more important than direct means). (ii) Minimizing any environmental restrictions that could have a negative effect on the profitability of capital” [Lopez, 1992, 1141]. Hence, one can see how the attractiveness of rapid economic growth from capital accumulation could lead to choices that put the environment at risk.

Countries are also attracted to the easy money that can be made by serving as storage areas for waste materials. Such actions obviously increase risks to the health of both citizens and the environment, while reducing similar risks in the producer country. The income that is generated may or may not be directed to measures designed to offset the export of environmental quality.

International Commodity Agreements

International commodity agreements (ICAs) are relevant to the discussion on international trade liberalization and the environment, not only for the role it may play in resolving the dilemma traditional institutions of the world's rural poor create, but for three other reasons as well. The first important topic regarding the environment and the development of third world countries concerning ICAs is the decreasing significance of national borders. Many environmental externalities are now felt on a transnational scale. For example, "the pollution of oceans, acid rain, the dwindling of species, the greenhouse effect, and global warming are among a few of the phenomena that manifest themselves on a transnational scale" [Kox, 1992, 933]. It is easy to see why so many people have a vested interest in the way third world nations go about achieving development.

Second, many experts are beginning to question the earth's ability to regenerate and recover from degradation. Some view earth's ecological systems as "nonlinear dynamic systems" and any changes to these systems may result in completely different conditions for future generations [Kox, 1991, 933]. Hence, curbing the desire to consume nonrenewable resources in developed and developing nations now will lessen the burden on future generations.

Third, the existence of global inequality in the distribution of natural resources is unsustainable in the long run. To illustrate this, one-fifth of the world's population consumes over 70% of the commercial energy produced annually [Kox, 1991, 933]. Environmental problems will grow exponentially when the billions of people located in developing countries begin to claim their share of the world's energy. Taking into consideration the goals for development of each country, the world can simply not support them all without some degree of global redistribution [Kox, 1992, 933].

In the past, international commodity agreements have failed for a couple of reasons. First, a problem with proposals in the past has been their roots in a "strong central fiscal and legal national authority to guarantee tax collections, legal entitlements, and liability rules" [Kox, 1991, 934]. Clearly, on an international level these assumptions do not apply. Second, some have proposed the implementation of international tolls for common access resources such as the oceans and air space. The

problem with this proposal is that determining the toll becomes subjective and there is only an indirect connection between pollution and its costs to the environment [Kox, 1991, 934].

In 1987, 60 developing nations counted on the export of primary commodities (agriculture & forest products) for more than half of their earnings from exports. “In 25 of these countries, commodities represented 80% or more of exports” [Kox, 1991, 935]. These countries depend on the same type of commodity exports that destroyed traditional practices and extensively damaged the environment. To make up for times when prices were low they simply exported a greater volume pushing the environment beyond its limits. The structure of international trade and tariffs also ensures that developing countries have comparative advantages in pollution intensive industries such as agriculture, forestry, and mining. Add to this the fact that it is difficult to internalize externalities in international commodity markets, it is worth while to examine international commodity agreements [Kox, 1991 935].

International commodity agreements are an opportunity to regulate international prices, production, and consumption of primary commodities in an effort to internalize environmental costs. The result of such an agreement is a price increase sufficient to cover more costly yet environmentally safe forms of producing such commodities [Kox, 1991, 937]. Before such agreements can be accomplished extensive research needs to be done. A complete analysis of the environmental effects of commodity production in the main producing countries needs to be undertaken. Alternative production techniques and their economic costs need to be analyzed. The elasticity of demand for the commodities and the form of the price mark up round out the considerations that need to be examined in the first phase [Kox, 1991, 937].

The second phase, and perhaps the more difficult one, requires negotiating a political agreement on the acceptable level of environmental damage, the amount of the price mark up, and the form of this price mark up (import surcharge, export tax, or other) [Kox, 1991,938].

In order for ICAs to be successful the commodity market must be homogenous in quality. As with any cartel, the main producing countries must agree to participate, but an ICA also requires the participation of consuming nations as well so that “transactions outside the sphere of the ICA are limited” [Kox, 1991, 940]. Finally, a stable supply is important to avoid arguments between traditional producers and new comers as well as deal with different production costs in different nations. Ideally, a

commitment to preserving the environment and therefore a dedication to the agreement will secure price premiums necessary for environmentally safe production methods, addressing development desires and environmental protection simultaneously [Kox, 1991, 940].

Brief Summary

So far evidence has been given in support of some form of modest intervention in international trade on behalf of the environment and to some degree development. The arguments, goals, and concerns of both free traders and environmentalists suggest that some form of intervention is necessary to balance the interests each group has and the blind action the groups take to pursue their objectives. Clearly, evidence suggests that international trade and its liberalization has some good and bad effects on the environment. Even the experts demonstrate, whether intentionally or not, that some form of intervention is necessary. For example, the Perroni and Wigle study demonstrates that while excessive amounts of regulations and trade barriers may not be the answer, domestic and international policies that internalize externalities are extremely beneficial to the environment, with minimal costs to gains from trade.

On a much more grand scale, international commodity agreements, with an environmental twist, address the issue of traditional practices of the poor, development, and environmental protection. Intervention of this type attempts to accentuate the positives from commodity trade (improving development) while eliminating some of the negatives (environmentally harmful production practices).

This overwhelming evidence is provided in lieu of more important theory based issues the above parties fail to recognize. Through the analysis of international trade cases, three market failures and three trade theory limitations will be exposed that require intervention to correct.

The Dolphin/Tuna and EC Nematode Cases

In August of 1990, the U.S. banned imported tuna from Mexico because it had failed to reduce the number of dolphins that were being killed by tuna fishermen. Shortly thereafter, Mexico appealed to the GATT panel on trade disputes saying that the U.S. had no grounds for the ban. The U.S. felt that it was justified because under GATT Article XX bans were

allowed to protect endangered species. Mexico argued that no endangered species were at risk and the GATT panel ruled in favor of Mexico [Brack, 1998, 30 & Whalley & Hamilton, 1996, 79].

Prior to the GATT ruling Mexico's tuna exports to the U.S. fell almost \$10 million in anticipation of the trade ban in 1989. The tuna trade to the U.S. from Mexico bottomed out at \$1.2 million from a previous high of \$13 million in 1988 [Brack, 1998, 30].

Before the ban was placed on imported tuna, the U.S Department of Commerce estimated that Mexico, Venezuela, Vanuatu, Spain, the Cayman Islands, Costa Rica, El Salvador, and Panama had dolphin kill rates that were 2-4 times higher (a total of 100,000 dolphins per year) than U.S. vessels. Mexico alone was estimated to kill about 50,000 dolphins each year [Brack, 1998, 31]. Dolphins were not the only species threatened by tuna fishing. "A typical catch of 1,000 tons of tuna included 2 sharks, 29 dolphins, 5 billfish, and an average of less than 1 sea turtle" [Brack, 1998, 47]. From these numbers one can place a value of \$118 on each dolphin's life. The trade costs to Mexico of the ban were at most \$11.8 million per year. The trade ban was estimated to save about 100,000 dolphins per year, therefore the value of each dolphin was \$118 [Brack, 1998, 47].

This case demonstrates very well the first of three market failures in international trade that requires some sort of corrective intervention. The market failure is that the prices producers and consumers of tuna faced did not reflect the true social cost of production and consumption of tuna. The prices of canned, fresh, and frozen tuna did not include the cost to tourists who may have been unable to see dolphins and other species harmed by tuna fishing in the eastern tropical pacific or the existence value many people place on the lives of dolphins. The \$118 per life seems to grossly underestimate the dolphin's true social value. Inefficient prices promoted the excessive harvest of tuna and therefore too many dolphin deaths.

Inefficient prices are also created by distortionary practices such as agricultural subsidies and escalated tariffs, which raise or lower prices above or below what is optimal. Removing subsidies for agriculture and energy would strengthen trade and the environment by improving allocative efficiency and reducing protection for environmentally unsustainable activities [Brack, 1998, 13]. In addition, reducing artificially high tariffs faced by developing countries on exported manufactured goods relative to raw materials and products can help

promote economic diversity, removing dependence on environmentally damaging resource use [Brack, 1998, 13].

The key to correcting prices that are not socially optimal is the implementation of the polluter-pays principle or in effect internalizing externalities. Economic instruments such as taxes and charges, tradeable permits, and deposit-refund systems can be good compliments to environmental regulations in an attempt to internalize externalities [Brack, 1998, 10]. The difficulty of implementing such instruments must be overcome, because in today's marketplace inefficiency is the norm not the exception [Esty, 1994, 66-67]. If this is the case, then trade liberalization cannot be trusted to allocate resources or to make polluters face the real cost of their actions.

The second market failure that the dolphin case demonstrates is the fact that some natural resources tend to be a common access resource, which can lead to its depletion and degradation. The fact that nobody owns the sea, or at least a portion of it where dolphins and tuna inhabit, fishermen are not precluded from exploiting the resource. Without property rights, fees for the use of the resource cannot be charged, thus there is no way to exclude fishermen from excessive resource use. Garrett Hardin described this issue as the "Tragedy of the Commons." According to Hardin, the exploitative use of common access resources by a small number of individuals would have a negligible effect on the resource. However, this same behavior by a large number of people is likely to destroy the resource [Esty, 1994, 13]. Government intervention or the establishment of ownership is necessary in monitoring common access resources and negotiating prices to limit the use of the resource [Esty, 1994, 67].

The third market failure which promotes inefficient use of natural resources and environmental degradation is the lack of consideration for future generations. The effects on the environment of some economic practices take a long time to surface, creating an incentive to ignore these costs at the expense of future generations. For example, in 1990 the European Commission banned the importation of raw, softwood lumber from the U.S. and Canada. The ban was enacted to prevent the transfer of a pinewood nematode, native to North America, to Europe. The nematode, which is carried from tree to tree by beetles, eats wood. The nematode does not cause disease in the U.S. and Canada, but when it was accidentally introduced to Japan by imported lumber it caused a disease called pine wilt, killing many trees [Brack, 1998, 34].

Canada was hit hardest by the ban, seeing its lumber exports to European countries fall from \$945.9 million in 1991 to \$315.3 million in 1993. Over this same time period the U.S. lost approximately \$119.3 million in lumber exports to Europe. Additional costs included \$500,000 invested in equipment to meet new import regulations for lumber quality and an estimated \$72 million in yearly production costs [Brack, 1998, 34]. The infestation was prevented at a cost of about \$214.2 million per year, mostly affecting Canada. If the nematode were allowed to enter Europe the effects would be devastating. Sweden and Finland run wood trade surpluses of billions of dollars each year, thus the ban may have saved more than trees, if one considers the number of people who would be out of work in Europe's lumber industry [Brack, 1998, 34, 47]. The point is that all the costs and benefits of the ban are calculated for the short run. The costs of infestation would affect Europe for decades in more ways than trade and jobs in the lumber industry. The European Commission made the right decision to enact the ban, but from a cost-benefit analysis position had the costs in trade to the U.S. and Canada been equal to or greater than the benefits to Europe, the EC would have failed to enact an inherently good trade restriction because it failed to consider the effect the infestation could have on future generations.

To correct for this problem, Cline argues for the use of a lower discount rate in cost-benefit studies. Using a lower discount rate will result in a higher present value of costs associated with environmental degradation, and also take into account shifts in the tradeoff between environmental quality and wealth that may occur over time [Esty, 1994, 40].

Without Government intervention, the assignment of property rights, or the implementation of economic instruments to internalize externalities, there is no guarantee that trade liberalization will be economically and environmentally efficient. The benefits of free trade must be weighed against the true social cost of trade, including the cost of environmental degradation, regardless of how flawed the valuation may be. Such actions will only serve to reduce tensions between free traders and environmentalists and bring the goals of the two groups more in line with each other [Esty, 1994, 4, 62-63].

Trade Theory Limitations

Many questions set forth in this research paper are based on economic

and trade theories. To keep questions and answers in perspective, it is important to talk about the limitations of trade theory for assessing environmental choices. Environmental amenities are difficult to define and measure, which makes the application of trade theory (a tool more suited for examining transferable and tradeable goods) much less precise [Zilberman, 1992, 1146-47]. For example, placing a value on a dolphin's life requires extensive analysis of not only the effects on trade by attempts to save its life, but also its existence and usage values, as well as the effects its absence has on the surrounding environment. Tourists' value the lives of dolphins for the pleasure they receive from seeing the dolphin, and others that may never see a dolphin have altruistic values of simply knowing that dolphins exist. Perhaps the most difficult to measure is the effects the loss of a species has on its surrounding environment. Biological, chemical, and physical interactions among species in a certain habitats are only just beginning to be understood by scientists. The costs to the environment resulting from the loss of a species or the effects of pollution are hard to calculate [Esty, 1994, 42].

Besides this, three other issues exist which limit trade theory's applicability to environmental regulations. The first problem is the issue of externalities. Many times the negative health effects of environmentally damaging activities cannot be contained within the boundaries of one nation. For example, manufacturing and production operations in the U.S. create conditions promoting acid rain. The acid rain, however, is not limited to the U.S., areas in Canada have suffered as much, if not more than places in the U.S. Trade theory lacks the mechanisms to correct for suboptimal prices and quantities resulting from unregulated free trade [Zilberman, 1992, 1147].

The second problem is that the consumption of environmental amenities now may have irreversible effects. Closely related to the market failure of ignoring future generations' preferences, trade theory is limited in the fact that most models are static or only look at a point in time. To uncover the real value of environmental amenities one has to take into account present and future valuations and trade theory models lack the ability to address decisions over time [Zilberman, 1992, 1147].

Finally, international trade models assume that countries control their own decisions regarding the use of resources. The fact of the matter is that larger developed countries use their bargaining power to influence trade to their advantage, whether it be for economical or environmental purposes, at the expense of smaller trading partners [Zilberman, 1992,

1147]. Some cite the Gulf War as an attempt by the U.S. to keep oil prices low to feed its insatiable appetite for energy.

Conclusion

Trade liberalization is going to remain a force on the international scene well into the future. International trade, while becoming the primary force behind welfare improvements and economic prosperity, is also a suspect in the reduction of environmental quality worldwide. Evidence supports the fact that to ensure environmental quality is factored into international trade decisions some form of intervention is necessary. Intervention is necessary to balance the interests of environmentalists and free traders. Researchers demonstrate that domestic environmental policies are an essential precursor to international trade for the consideration of environmental quality. The research of Perroni and Wigle suggest that domestic policies, which serve to internalize externalities, are extremely beneficial to the environment with only moderate costs to trade.

International commodity agreements provide the opportunity to address the issues of poverty, traditional practices, and environmental protection. Intervention in the form of ICAs attempts to achieve the best of both worlds, emphasizing the positives of commodity trade and intervention on behalf of the environment.

The market failures identified in the two cases also demonstrate the importance of intervention. In today's marketplace inefficiency is often the norm, not the exception. If this is the case then trade liberalization cannot be trusted to allocate resources or to make polluters face the real cost of their actions. Government intervention, the assignment of property rights, and the implementation of the polluter-pays principle are necessary to address the market failures of inefficient prices, intergenerational inequality, and the exploitation of common access resources. Trade theory also has limitations that prevent trade liberalization from fully considering the importance of the environment in transactions. The sheer difficulty of defining and measuring environmental amenities in itself requires intervention to assure that these values, regardless of how flawed they may be, are represented in trade decisions. Trade theory models also lack the ability to adjust for suboptimal prices and quantities resulting from externalities, the problem of assessing decisions overtime, and countries who are not in control of

their own resources. In conclusion, the evidence is overwhelmingly in favor of at least some form of intervention to find an equilibrium between international trade liberalization and environmental concerns.

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