NORTH-SOUTH TRADE, CAPITAL FLOWS AND THE ENVIRONMENT

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Summary

Environmental linkages between the North and the South are reviewed. Notions of comparative advantage seem to suggest that availability of environmental inputs should have implications for location of production and/or trade. Since the poorer South has environmental regulations that are relatively lax, it has a comparative advantage in environment-intensive goods. A tightening of environmental regulation in the North would reinforce this.

The data lends limited support to this hypothesis. This is possibly due to the fact that the environmental costs are a very small proportion of total costs. Similarly, in the decision to invest abroad, environment considerations are not found to be important.

1. Introduction

In this Theme we are interested in issues of sustainable development. For this we need the concept of a stock of environmental or natural capital. We are interested in tracking the path of such a variable over time. Any precise operational definition of this concept has proved elusive. The reasons are not hard to see—we need preferences to be defined over an infinite horizon, a catalogue of possible new products and technical progress, population size, etc. We may still hope that there are flows (i.e. production and

consumption of goods), which we can identify as helping or hindering the cause of sustainability. A major concern of this literature is how the raising of living standards in the developing countries—the South—would affect the availability of the natural capital that is left for future generations. The development process of the currently rich countries—the North—was very "dirty" i.e. destructive of the world's environment. A duplication by the South of that path of industrialization is clearly not feasible.
The word *environment* is too all-encompassing, especially in the context of the North–South divide.

The South's major concern under the heading of environment is a requirement for population control, access to clean water, land which is not degraded, etc. Northern concerns are primarily with pollution—how the South's production activity affects the pollution content of their exports—and the level of harmful atmospheric gases and the effects on sinks for those gases, such as tropical forests.

The interface between international trade theory and environmental economics also focuses its attention on these issues. Ironically, even in development economics most discussions of growth and development in the past ignored environmental concerns. Since the early 1990s, however, this has changed. A large literature dealing with the interaction of trade, environment and development issues has appeared.

This article is concerned with trade and capital movements between the North and the South. In particular, how these are affected by the environmental regulations in the North and how these trade and capital flows (or the threat of these) affect environmental policy. I will outline these issues in a neoclassical framework and my discussion of general issues relating to trade will be brief since these are discussed at length in *International Trade, the Environment and Sustainable Development* in this volume.

The discussion on North-South trade in an environmental context presumes that the South is better endowed with the environmental "input". The number of kilograms of effluents per US dollar of output vary enormously across countries; for example, there are effluents for which Indonesian production is cleaner than the US. When disaggregated by sectors the picture becomes even more hazy. Take, for example, the toxicity of atmospheric emissions—US textile production is much dirtier than that of Mexico. This is also true for plastics.

Having said this, let us follow the standard formulation and assume that the South is better endowed in "the" environmental input. It should therefore export goods that use the environment intensively. While the empirical evidence in favor of this is far from clear-cut, concerns have been raised (mainly in the North) that the South is deliberately exploiting its environmental resources to gain an unfair advantage in trade. There are also fears that the South's actions are not sustainable.

On top of this, it is feared that as environmental standards are raised in the North, mobile factors of production will move to the South where environmental standards are lax. Northern (labor and environmental) lobbies want similar environmental standards to be adopted in the South. The South views this as unwarranted protectionism. Also the

evidence on foreign investment by multinationals does not accord any special place for lax environmental standards.

2. An overview of North-South Economic Interactions

In matters of trade and capital flows, the North strides the commanding heights of the world economy. A rough estimate indicates that the top 20% of the world's population controls about 80% of the world GDP. Most relative prices in the international economy are determined in the North because of its share in total world wealth and its organized markets (there are exceptions, though, such as oil and gas). The South takes world prices and the North's environmental policy stance as given. This implies that the South has to share the environmental agenda of the North. As mentioned in the Introduction, a lot, though not necessarily all, of the issues raised in this agenda are of global concern.

Broadly speaking, the post-war free trade system ushered in by GATT has benefited the South. Poor countries have used trade as an "engine" of growth. This is, however, not true for all the developing countries. For instance, contrary to intuition, in cross-country regressions on growth, natural resource endowments usually show up with a negative coefficient. Some of these natural resource rich economies have faced a progressive deterioration in terms of trade. Leaving these countries aside, over time, as parts of the South have industrialized, the developed countries have introduced other items in the GATT agenda, e.g. trade in services, intellectual property rights etc. The South has misgivings about some of these but it is true that these are new issues that were not around when the original GATT agenda was formulated. In the protectionist lobbies in the past, low wages in the South was seen to be the main cause of the loss of industrial jobs in the North. Now with successive tightening of environmental standards in the North, low environmental standards in the South are also seen as a cause of unemployment in the North. Hence the call for "fair" (as opposed to "free") trade and objections to the South's (low) environmental (and labor) standards.

The South has also benefited from FDI as the new machines create employment while embodying the latest technology. Historically, since colonial times FDI has been undertaken by the North in the South. But in earlier periods, these went into mining and other extractive sectors and hence were not a cause for concern among the organized labor in the North. But since decolonization, and especially since the rise of the newly industrialized countries in Asia, manufacturing activity has started to move in a big way to the South. There is a fear that environmental concerns in the North will raise costs of production there causing a shift in comparative advantage to the South where standards are more lax. And for certain activities it would be profitable to shut-up shop in the North and relocate to the South—the "pollution haven". This is the so-called **race to the bottom**. Thus, in this view, trade exports jobs and investment abroad which only makes this situation more irreversible. There are those who are opposed to this view and point out that multinational corporations provide the latest technology and work practices in their plants located in the South. The evidence, reviewed briefly in section 4, on this issue suggests that in the past multinationals' environmental standards in the plants in the South were considerably lower than in the North. It is possible that in more recent times there is a tightening of standards as environmental practices of multinationals are subject to greater scrutiny in the North.

Economists have used the concept of comparative advantage for about two centuries to explain the pattern of production and trade in the world. In a simplified two country two commodity framework this simply boils down to asking: what is the commodity that the country produces at lowest cost (in relative terms)—see *International Trade, the Environment and Sustainable Development* for a discussion. This, however, does not guarantee that the good will be exported. For this we require not only that preferences be identical but also homothetic (i.e. when faced with the same (relative) prices, all individuals consume all the goods in the same proportion—this rules out the case where the wealthy are more environment conscious). Without identical homothetic preferences, tastes, by themselves, could constitute the explanation for trade. As discussed in *International Trade, the Environment and Sustainable Development*, there are two major theories of international trade, viz. the Ricardian theory and the Heckscher-Ohlin theory. The former emphasizes differences in technologies to explain comparative advantage while the latter relies on relative factor abundance. In recent times, a third explanation—the "new" theory—relies on market structure and increasing returns to explain the pattern of trade.

In the environmental economics literature, "the environment" is treated as a factor of production. This begs the question of how do we construct an aggregate for the environment. It is a shortcut for a more long-winded statement viz. that production pollutes, and hence pollution is an output jointly produced with the final good and a reduction of pollution, for a given level of output—abatement—is costly. But what is the "true" price of this input? It is whatever the society thinks it is worth. But that, in turn, depends on preferences. For instance, a society, which values the environment more, would be willing to sacrifice more of other goods for this. This varies across economies, and tastes are not identical and homothetic. Also, presumably the pollution input is variable, so its endowment is endogenous and changes over time.

Keeping these points in mind, we can then talk about countries that have a comparative advantage in pollution intensive and natural-resource-intensive goods. Poorer countries may tend to put a lower value on a clean environment and hence are considered to have a large endowment of pollution intensive goods. For example, Japan has a very large forest cover but imports logs from South-East Asia. Similarly a poor country would probably deplete (even exhaust) its natural resource base at a rate higher than if it were richer. It is this kind of reasoning that led the then Vice President of the World Bank, Larry Summers to suggest that industrial waste should be shipped from the North to the South—the South does not have a technological or ecological superiority when it comes to absorbing waste but today is the poor relative of the North.

3. North-South Trade and Investment: Policy Issues and Models

3.1. Preferences, Environment and Trade Policy

What are the links between international trade and the environment? Four channels are identified in the literature—two of them familiar from standard trade theories. First, in line with the international trade theory, depending on a country's comparative advantage there is a composition effect—who will produce what and how much? In a closed economy all the demand has to be met by domestic production—trade allows a

country to specialize. Second, trade may impose restrictions on the technique of production—in the simple Heckscher-Ohlin model with incomplete specialization in trade, the techniques are identical across countries. Third, as trade changes the scale of production what happens to the environment? Especially if environmental taxes were not at their **Pigouvian** level (equating the tax with the marginal damage pollution causes to society) to start with. And finally, as trade raises incomes, people have a higher willingness to pay for a clean environment.

In the literature there are models that look at a world economy where pollution is local and the North sets a higher environmental standard. This has a composition effect, causing the polluting industry to contract in the North and expand in the South. As incomes rise in the South, the willingness to pay for a cleaner environment also rises; this means income effects, discussed in the previous section, are important, but usually the composition effect dominates and the South ends up with a higher level of pollution, while in the North pollution declines.

If, on the other hand, all pollution is global, then increased trade relocates production from the North to the South, leaving world pollution unaffected—the South gains and the North loses from free trade due to the existence of a **pollution haven**. Moreover if a free trade agreement were to freeze pollution at the autarky levels, then the North gains and the South loses. This possibly explains why the North (or lobby groups within it) wants to link the environment to trade and the South opposes such a move.

A question that arises is whether trade policy (via a tariff or quantitative restrictions) should be used to correct an environmental distortion? The answer from international trade theory is, in general, "no". If the environmental distortion is the only departure from a competitive structure, then the best policy (called the **first-best policy**) is to tackle the pollution at its source, through a Pigouvian tax. Trade policy can at best be a second-best solution. This is not an arcane theoretical issue in the North-South context. By granting other nations the **Most-Favoured-Nation** status under GATT-WTO, the North has surrendered its market power. It could levy the equivalent of an optimal tariff by imposing environmental taxes, which raise tax revenue and deteriorate the South's terms of trade. The North could get a **double dividend** if the terms of trade advantage and the tax revenue from lowering other distortionary taxes more than makes up for the direct contractionary effect of the environmental taxes.

In one area, global intervention is called for—in the protection of the global commons. In the absence of intervention—through inter- governmental cooperation—there is too little production (preservation) of this global public good. Every country has a tendency to misrepresent its preferences, free ride etc. But even here trade policy is not the correct policy instrument for the unwillingness of countries to share the burden of protecting the global commons, as these distort consumption decisions. There are international treaties where consensus has been arrived at relatively easily, e.g. the Montreal Protocol, and CITES. But where there are substantial costs in terms of GDP or terms of trade losses, such as in the case of cutbacks in CO_2 emissions, agreement has been more elusive (see *International Cooperation to Resolve International Pollution Problems*).

In an introductory public finance course, it is shown that, barring extreme cases, it does not matter whether the buyers for a good are taxed or its sellers—the incidence of the tax is shared by the consumers and the producers. But in an international setting, for a reduction in carbon emissions and hence curtailing the consumption of fossil fuels, it does matter who gets to keep the tax proceeds. For instance, if the producers are allowed to keep the tax revenue then the cutback in demand would resemble the oil price hikes of the 1970s. On the other hand, if consumption is taxed, then it would show up as a decline in the demand for oil but the consuming countries would get to keep the revenue, thus hurting the oil-producers. The issue of the initial distribution of property rights or tradable permits becomes crucial.

3.2. Property Rights and Trade

A different literature identifies North-South trade in terms of different institutions of property rights. As an economy gets integrated into a market system, traditional collective (community) ownership of "the commons" breaks down. Migration takes place and a sense of community disappears. Property rights previously vested in the community become ill-defined. Examples of this abound—forestry, rivers, oceans. Free riding becomes possible in this scenario; one may extract from the commons without penalty or deterrence. Much has been written on the question of over-harvesting by the trawlers of fish stocks off the Atlantic coast of Canada and also the conflict it often gives rise to between traditional fishermen—likewise the case of the trawlers from EC countries off the coast of Senegal.

In the South, apart from a breakdown of traditional forms of communal ownership, there is a problem of widespread corruption and weak law enforcement. In this situation, state-owned land is often treated as a common access regime—e.g. forests, game parks (sometimes even government owned financial institutions function like an open access regime!), etc. In such a situation it is not clear that the traditional cure for market failure—government intervention—improves things. We have to trade off government (or policy) failure against market failure.

We can analyze the effects of property rights on trade. Suppose in a North-South trade model there is no difference between these blocs in terms of endowments. The difference lies in the property rights—the North has well defined property rights and the South has an open access regime. An open access regime leads to an over-harvesting of the environmental resource in response to current prices. Additionally, since the ability to appropriate returns is a problem, there is no incentive to manage the resource in an optimal way from a dynamic viewpoint—this leads to a disappearance of fish stocks, forests etc.

Given an open access regime in the South the environmental resource is over-harvested and the South shows an "apparent" abundance of the environmental resource. If tastes are identical and homothetic, in autarky, the price of the environmental good will be lower in the South. Free trade will cause the North to import the environmental-intensive good from the South, thus exacerbating the overexploitation of resources. These give rise to **apparent gains from trade**. Trade is actually welfare reducing but without looking at the cause of factor abundance, it does not appear to be so. Similarly,

one can see that if the natural resource were exhaustible, it would be exhausted faster than would be the case if the property rights were well-defined.

There is evidence in favor of this. Consider, the importation of logs by Japan. Japan, after an initial burst of depletion of its natural resources, has been very protective of its own forest cover and has imported logs from Indonesia and Malaysia. In these countries—where property rights are not always well-defined—there has been widespread depletion of tropical forests, with concerns elsewhere in the world about the **global commons**. While logging may be a labor-intensive activity, stricter regulation in Japan and the property rights regime in the exporting country are also important in depleting forest cover.

3.3. Models of Capital Flows

Turning to models of FDI, there are fewer theoretical (and we shall see below, empirical) contributions. Traditional FDI models were about locational advantage which had to be availed of in a particular place. One example of this was the tariff-jumping theory of FDI—the host country had a market that could be provided for cheaply by locating production there, otherwise a tariff had to be paid. There is a counterpart in the environmental literature, when production is not so much attracted to the South by its regulations but is repelled from the North through the tighter environmental regulations there. As an example consider the following: Both the North and the South have some capital and some polluting inputs and produce a homogeneous good. Both inputs are footloose in that they respond to price changes but only capital moves internationally. If capital movement is allowed, capital moves from the capital-rich North to the environment-rich South. This brings the environment-capital ratios together. In an integrated world, i.e. when capital yields the same rate of return everywhere, a tightening of environmental standards causes capital to flow out and may actually increase pollution in the recipient country.

A different kind of capital movement that has become important in the last few years is that of financial capital. For instance the East and South-East Asian and Latin American economies have opened their capital accounts to financial flows, though in the wake of the Asian crisis capital flows to these countries have dropped significantly. What is the relationship between the ability to borrow in the international capital markets and the environment? Consider the following example: Citing the poor human rights record of the Indonesian government, there have been calls for all capital flows to be cut off to that country.

What would be the effects of these on the environment? If Indonesia views the Asian crisis as a temporary setback, it would try to borrow and smoothen consumption. If all lending is cut off, then it may seek to find other ways to prevent a sharp drop in its consumption. It may choose to cut down parts of its remaining forests that the rest of the world believes plays a role in acting as a sink for greenhouse gases. Higher consumption could be polluting but may be better in terms of protecting these sinks. This simple example shows how access to international capital markets may allow poor countries to borrow against higher future income and relieve some pressure on the (global) environment.

4. Some Empirical Evidence

In this section I shall review some of the empirical evidence. I shall endeavor to cover the evidence on: (a) Heckscher-Ohlin type models—most of the empirical literature focuses on this, (b) on foreign investments and the pollution-haven hypothesis, and (c) environmental consequences of agricultural exports. The evidence on greenhouse gases and global warming is discussed elsewhere (see *International Environmental Agreements and the Case of Global Warming*).

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Biographical Sketch

Partha Sen was educated in Economics at the University of Delhi, University of Birmingham and London School of Economics. Professor of Economics at the Indian Statistical Office, previously positions at the Delhi School of Economics, London School of Economics, University of Illinois and University of Bristol. He has been Visiting Professor at the University of Washington, Illinois and Michigan. His research interests are in Macroeconomics, International Trade, and Environmental Economics. Previously he was co-editor and later editor of the Indian Economic Review.