Trade and Environmental Protection: Another Look at the Issues[*]

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> *"Economic growth is not a panacea for environmental quality; indeed, it is not even the main issue. What matters is the content of growth— the composition of inputs (including environmental resources) and outputs (including waste products)." –Arrow et al (1995)*

I. Introduction

With no let-up in the pace of globalization and advances in technology, the interrelationship between trade and the environment has become an even more pressing issue across the globe. Heated discussions continue to abound in various fora involving all sectors-- from the streets to the civil society, the academic, business and government; at the national, bilateral, regional and multilateral levels. And certainly, it is crucial to understand and address environmental and sustainability concerns that could accompany the escalating trend in trade and globalization.

The issues between trade and environment are found in various areas of concerns. One is in the area of *governance.* The debate here has focused on how international trade has impacted on environmental regulations. Has it encouraged a "race to the bottom" in environmental standards, or "a race to the top," leading to a convergence of standards at a higher level. Another set of issues relate to *competitiveness*. This is of course linked to the first, with governance affecting competitiveness, and competitiveness issues affecting or influencing the manner of governance. Strict environmental regulation will affect a country's competitive advantage. The question arises whether environmental protection has been more of a disguised form of protectionism. On the other hand, it is also argued that increased trade and growth could eventually lead to better environmental protection (environmental Kuznets curve[1]). Then, the questions have turned into *North-South issues*-- the debate over the disparate implications for the developed and developing countries – whether globalization will lead to "industrial flight" from the North and the growth of "pollution havens" (or "pollution haloes") in the South. Another major concern is with regards to *corporate strategy*, specifically the issues of transboundary environmental management and corporate standards applied by TNCs in their subsidiaries located in the developing countries. (Jenkins et al. 2002). Finally, we go back to the issue of governance—at the global level. What is the state of the global environmental regime that could govern these issues in trade and environment linkages?

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[1] The Environmental Kuznets curve refers to the predicted relationship whereby environmental quality first deteriorates and then improves as per capita income level rise.

This paper aims to contribute to the discussion, mainly by looking at some theoretical underpinnings, learning from some findings in the literature and offering additional empirical evidence in relation to what is happening in the globalized world. Hopefully, it could shed light on some of the key questions arising from trade and environmental issues. For example, is there evidence that international trade encourages a "race to the bottom" in environmental regulations? Are developing countries more likely to export polluting products? Is there evidence of international competition in attracting polluting industries? What is the state of the global/ multilateral regime dealing with trade and environment? Towards this end, the paper has five main sections. The next section looks at some theoretical underpinnings and findings on trade and environment linkage. This is followed by a discussion on the current trade structure of products by pollution-intensity classification between developed and developing countries. The next two sections deal respectively with some observations on environmental regulations and the environment in the multilateral agenda. Finally, the concluding section reiterates the need to pursue trade and environment policies in tandem.

II. Trade and Environment Linkage: Some Theoretical Underpinnings and Literature Findings

Trade theory suggests that for a small country, in the absence of market imperfections (e.g., the case of externalities), the use of trade barriers (whether in the form of tariffs or in the form of quantitative restrictions) creates market distortions that reduce overall welfare. Environmental concerns almost invariably involve externalities that cannot be captured by market forces alone. As such, some would argue that this situation calls for the use of trade control measures to more effectively achieve environmental goals. On the other hand, the use of trade measures for environmental purposes has been viewed as disguised protectionism. The issues however, have become more complex, going much further than this, covering interrelated impacts on governance and competitiveness, and north-south issues.

The trade and environment linkage has already been a subject of a number of academic discussions and notable empirical analyses. Various works attempt to provide empirical evidence about the nature and impact of these linkages. And not surprisingly, findings are mixed, if not conflicting. For example, according to Birdsall and Wheeler (1993), pollution intensity in developing countries grew fastest when environmental regulations in high-income countries were toughened, supporting the view that different environmental standards could create pollution havens. On the other hand, analyzing import-export ratios for five heavily polluting industries, Mani and Wheeler (1998) find that pollution havens may exist only temporarily, if at all. Wilson et al. (2002) regress – in addition to several control variables – measures of environmental regulations on dirty exports of 24 OECD and non-OECD countries. Their results indicate that in some industries a significant negative linkage can be established. On the other hand, Tobey (1990), Low and Yeats (1992), Van Beers and Van den Bergh (1997), Jänicke et al. (1997), Xu (2000), Xu and Song (2000), Harris et al. (2002), Grether and De Melo (2003) and Kahn (2003) find very little or no evidence that differences in environmental regulations across countries are a significant determinant of trade flows. (Busse 2004)

In these attempts however, the data limitation[2] remains a hindrance to make a comprehensive conclusion or even close statistical relationship of both areas. What is certain however is the debate over the linkages between trade and environment will remain and could become more complex in the future arising from increased global and regional integration.

Nonetheless, while various studies might offer conflicting and/or inconclusive empirical results, clearer implications can at least be derived from the basic theoretical underpinnings about the relationship between trade and environmental policies. **This is that there should be no conflict between good economic policy and good environmental policy, between trade and environmental management. Good economic policy should not prevent the adoption and implementation of good environmental policy, and vice versa**. To be sure, ideally, good economic policies and good environmental policies should both be present in order to attain optimum welfare. This is when goods and resources are properly priced and the market would work more efficiently, leading to optimum welfare. In the heat of the discussions, this fundamental argument is often overlooked. Indeed, this hypothesis is central and could shed some light on the many issues surrounding trade and environment.

However, in the real world, there is often lack in policy and policy administration in dealing with both areas of trade and environment. When nothing is done about the level and quality of environmental protection, there is fear that unrestrained international trade could lead to environmental degradation. On the other hand, there is apprehension that environmental protection can be no more than disguised protectionism. These are certainly legitimate considerations that should be addressed. In many instances, there is tendency to mix and match policy tools in an attempt to make up for this lack. Indeed, although some are better than others, there are no perfect policies.

The question is what is good-enough policy in the first place? What does a good environmental policy imply? Generally, it is one that leads to correct pricing of environmental resources, i.e, one that reflects relative scarcities and value to society. Hence, just as in the case of capital and labor, the relative price of environmental resources depends on relative factor endowments. If one country has a lower environmental standard than another, it could simply be a true reflection of the country's absorptive capacity, and not necessarily evidence of a "race to the bottom" or existence of pollution havens. Then again, there could be synergy between trade and environmental regulation. Openness to trade could lead to better environmental regulation (this is besides the possible positive income effects). Conversely, good environmental regulation could benefit trade. (The paper returns to these points later). Hence, more in-depth analysis and empirical evidence is necessary to draw clear conclusions on these issues regarding the possibility of "race to the bottom" and pollution havens.

Race to the Bottom

[2] Example is the lack of adequate and comprehensive data on the stringency of regulations across countries. To address this, multilateral initiatives and environmental data collection activities are currently being done by OECD, EUROSTAT, Blue Plan Medstat, European Environment Agency, World Conservation Union, WHO and other organizations from various MEAs or conventions.

- *Will trade and globalization lead to a "race to the bottom"* in environmental standards?

The race-to-the-bottom hypothesis was initially formulated in the context of local competition for investments and jobs within federal states with decentralized responsibilities for the environment. (WTO 1999)

Critics argue that increased competition for trade and foreign direct investment could lead to lowering of environmental standards and regulations. (WB 2000)[3] Governments which attempt to maintain high standards will see their efforts undermined by the existence of less stringent regulations elsewhere and this will lead to an overall lowering of environmental standards internationally.[4] (Jenkins et al 2002) This is the reason why trade unions and environmentalists lobby for the binding of international environmental standards within the framework of the WTO, to ensure a "level playing field" for all exporters.

The fears however that globalization necessarily hurts the environment through this "race to the bottom" are not well founded. (Frankel 2003) A WTO case study concluded that the roots of the environmental degradation were not caused by international trade as such, but various market and policy failures. (WTO 1999)

A case in point is the contention that growth in the developing countries must necessarily be accompanied by severe environmental degradation. Recent evidence however suggests a more subtle and complex relationship between economic development and environmental protection. Many developing countries appear to have started the fight against pollution at much lower levels of income than the rich countries did in their day. (WB 2000)

Busse (2004) finds evidence that suggests that the level of environmental regulations is influenced by income level. The primary effect appears to come via income itself. Some of the results support the environmental Kuznets curve, that growth harms the environment at low levels of income and helps at high levels. (Frankel and Rose 2001) As real income rise, their demand for environmental quality rises. This translates into environmental progress under the rights conditions, including democracy, effective regulation, and externalities that are largely confined within national borders and are therefore amenable to national regulation. (Frankel 2003)

Furthermore, Frankel and Rose (2001) finds positive correlation between openness to trade and some measures of environmental quality.[5] In other words, trade may indeed have a generally beneficial effect on certain measures of environmental

[3] World Bank Briefing Papers 2000. Part 4: Is Globalization Causing A 'Race To The Bottom' In Environmental Standards? April.

[4] A less extreme version of this is the "Race to the Bottom" hypothesis is the "*stuck-in-the-mud*" hypothesis that competition while not necessarily leading to a reduction in environmental standards, does discourage governments from raising standards – sometimes also referred to as the "chilling" effect of globalization on environmental regulation.

[5] But they cautioned that this could be due to endogeneity of trade, rather than causality.

quality.[6] Across seven measures, the beneficial effect is only significant roughly half the time, but one can at least say that there is no evidence that trade has the detrimental effect on the environment which the race-to- the-bottom theory would lead one to expect. (Frankel and Rose 2001) Openness can indeed provide developing countries with both the incentive to adopt, and the access to, new technologies, which may provide a cleaner or greener way of producing the good concerned. For example, much foreign investment is for export markets. The quality requirements in those markets encourage use of the latest technology, which is typically cleaner than old technologies.[7] (WB 2000)

The Pollution Haven Hypothesis

Another concern relates less to environmental outcomes and more to environmental regulation. It is argued that increased international competition for investment will cause countries to lower environmental regulations (or to retain poor ones), a "*race to the bottom*" in environmental standards as countries fight to attract foreign capital and keep domestic investment at home. (WB 2000) This hypothesis is analogous to tax havens which apply low rates in order to attract financial capital. It implies a deliberate strategy on the part of host governments to purposely "undervalue" the environment in order to attract new investment. (Jenkins et al 2002) According to classical trade theory based on differences in factor endowments, these polluting industries (including such industries as chemical industries, ferrous and non-ferrous metals, pulp and paper, and oil refining) are more likely to conglomerate in capital-abundant developed countries, and to a lesser extent, in economies in transition and newly industrialized countries. (WTO 1999)

Developing countries concerns on environmental regulation is the erosion of their competitive position due to the movement of pollution-intensive industries to countries with lower standards. (Busse 2004) However, there is no evidence that the cost of environmental protection has ever been the determining factor in foreign investment decisions. Neither study on trade flows nor on FDI flows suggest that environmental regulations are an important factor in international location decisions. (WTO 1999) Factors such as labor and raw material costs, transparent regulation and protection of property rights are likely to be much more important, even for polluting industries. In fact, countries do not become permanent pollution havens because along with increases in income go increased demands for environmental quality and a better institutional capacity to supply environmental regulation. (WB 2000)

In East Asia in the 1970s, for example, the fast growing "Tigers" (Korea, Taiwan (China), Singapore and Hong Kong) began to export more of certain highly polluting sectors, while Japan began to reduce its exports in these sectors. However, this trend diminished in the 1980s, and a stable pattern emerged with the Tigers importing somewhat more than they export in the highly-polluting sectors. In China the share of the

[6] Favourable "gains from trade" effects dominate for measures of air and water pollution such as SO2 concentrations. (Frankel 2003)

[7] A World Bank study of steel production in 50 countries found that open economies led closed economies in the adoption of cleaner technologies by wide margins, resulting in the open economies being 17 percent less pollution-intensive in this sector than closed economies (Wheeler, Huq and Martin 1993).

five dirtiest industries in total industrial output has fallen, while imports of pollution intensive products have actually increased. (WB 2000)

A recent study shows FDI originating from Hong Kong, Macao and Taiwan is attracted to provinces with a relative abundance of low-skilled labor, and relatively weak environmental controls. In contrast, FDI from non- Chinese sources is attracted by high levels of skilled labor and by high pollution levies—the reverse of the pollution haven hypothesis. (Dean et al. 2004).

A similar pattern occurred in trade of pollution intensive products between North America and Latin America. (WB 2000) For the US, there appears to be evidence for the hypothesis that stringency of environmental regulation is a source of comparative disadvantage in dirty industries. (Mulatu et al 2004) Smarzynska and Shang-Jin Wei (2001) found some support for the "pollution haven" hypothesis, but the overall evidence is relatively weak and does not survive numerous robustness checks. A shift toward cleaner industries has also occurred among U.S. imports with no evidence that pollution-intensive industries have been disproportionately affected by the tariff changes. (Ederington et al 2004)

Eskeland and Harrison (1997) find almost no evidence that investors in developing countries are fleeing environmental costs at home. Using data from four developing countries (Cote d'Ivoire, Mexico, Morocco, and Venezuela), they examine the pattern of foreign investment with an analysis of U.S. outbound investment between 1982 and 1994. They reject the hypothesis that the pattern of U.S. foreign investment is skewed toward industries in which the cost of pollution abatement is high.

On the other hand, Waldkirch and Munisamy Gopinath (2004) found evidence of a pollution haven effect from Mexico albeit limited to only a few industries. While only a few industries are estimated to have a positive correlation between pollution and FDI flows, these may account for a substantial share of received FDI and output. Depending on the empirical specification, they account for anywhere between five and 40 percent of total FDI and between five and 30 percent of output over the sample period. Other than that, FDI is largely driven by Mexico's comparative advantage in labor-intensive production processes. For other pollutants that are less regulated or come largely from non-industry sources, no systematic relationship between FDI and pollution is detected. Waldkirch and Munisamy Gopinath (2004)

Busse (2004)[8] finds no evidence to support the pollution-haven hypothesis that industries facing above-average abatement costs with environmental regulations would relocate their activities in pollution havens. The exception is iron and steel products, where a negative and statistically significant link is established, implying that higher compliance with international treaties and conventions and more stringent regulations are associated with reduced net exports.[9] Neither did (Busse 2004) and Baumert and Kete

[8] This study based on a Hecksher-Ohlin model used comprehensive new database for environmental regulations across 119 countries and five-high polluting industries.

[9] High-income countries, where environmental regulations are usually more stringent in comparison to middle or low-income countries, have experienced a considerable decline in the export-import ratio of iron and steel products since the late 1970s.

(2002) find likely evidence that the Kyoto Protocol will drive industry to developing countries. Labor cost and skills, market size, political stability, income levels, physical infrastructure, and a wide range of government policies (eg. relating to tax, financial and investment) are typically the main investment considerations.

III. Current Trade Structure of Pollution Intensive Products

This section attempts to look for further evidence about the impact of trade on the environment. Although there are many environmental indicators, this paper uses pollution index or pollution intensity in the analysis, primarily because of the relatively comprehensive nature of environmental regulations addressing pollution. The other reason is more practical-- the availability of comparative data across the countries.

Specifically, this paper looks at the trends in the share of pollution-intensive industries (as most commonly used) for developed and developing countries. This paper takes as given that all these countries have more or less become more open, with the removal of trade barriers around the globe, especially the Asia-Pacific region. There are, of course, other factors that determine the share in exports of these industries, most importantly, the level of environmental regulations. However, this is difficult to quantify, with little or no available comparative data. Hence, the conclusion we could derive would be limited to more intuitive interpretation of findings.

- *Is there evidence that developing countries are more likely to export polluting products?*

Table 1 shows the structure of exports and imports trade for developing and developed countries (See Appendix Table 1 for the complete list) by pollution classification.[10] The exports and imports of hazardous and/or pollutive products comprise around 69% and 68% of total exports and imports respectively. These are highly concentrated in the developed countries. This is, of course to be expected as developed countries dominate world exports. What is more striking is that it is only in the non-hazardous/non-pollutive exports where the average share of developing countries comes close to that of the developed countries (42% to 55% respectively). Thus, there appears to be no evidence that developing countries are more likely to export polluting products. On the contrary, these results would tend to indicate that developing countries are less likely to export polluting products. Indeed, developing countries has a higher revealed comparative advantage index (RCA) for these non-pollutive and non-hazardous exports at around 2, compared to that of around 0.7 for the developed country. In contrast, developed countries have a higher RCA index on pollutive products than developing countries although not by as much (1.02 versus 0.91) Table 2 shows the RCA index per specific product classification.

[10] Based on Philippine Environmental Management Bureau classification. Actual pollution intensity of each product may differ from one country to another.

Table 1. Average share of trade products, per country group, by pollution classification, % (1996-2000)

Pollution Classification	Country Group	*Average Share*	
		Export	Imports
Extremely Hazardous/Highly Pollutive			
	Developed	61.56	73.34
	Developing	29.36	23.45
Hazardous/ Highly Pollutive			
	Developed	72.29	66.96
	Developing	19.79	28.82
Non-Hazardous/ Highly Pollutive			
	Developed	72.99	82.05
	Developing	24.45	14.96
Extremely Hazardous/ Pollutive			
	Developed	77.76	63.93
	Developing	18.87	31.79
Hazardous/ Pollutive			
	Developed	80.69	82.44
	Developing	16.76	30.86
Non-hazardous/ Pollutive			
	Developed	78.19	74.27
	Developing	19.58	21.47
Hazardous/ Non-pollutive			
	Developed	83.58	73.29
	Developing	13.44	22.57
Non-Hazardous/Non-pollutive			
	Developed	54.63	76.87
	Developing	42.1	21.51

Notes: 1. Classification based from Environment Management Bureau (EMB) based on Medalla (2001).

2. Shares of developed and developing may not add to up to 100% since trade data of least developed countries (LDCs) et al are not classified/included as developing.

Source of Data: PC-TAS (SITC)

Table 2. Revealed Comparative Advantage Index

Pollution Classification	Country Group	RCA Index	
		1996	2000
Extremely Hazardous/Highly Pollutive			
	Developed	0.82	0.78
	Developing	1.37	1.44
Hazardous/ Highly Pollutive			
	Developed	0.97	0.98
	Developing	0.91	0.90
Non-Hazardous/ Highly Pollutive			
	Developed	0.97	1.00
	Developing	1.15	1.08
Extremely Hazardous/ Pollutive			
	Developed	1.03	1.05
	Developing	0.90	0.88
Hazardous/ Pollutive			
	Developed	1.08	1.08
	Developing	0.77	0.81
Non-hazardous/ Pollutive			
	Developed	1.04	1.09
	Developing	0.93	0.81
Total for All Pollutive			
	Developed	1.02	1.03
	Developing	0.91	0.93
All Non-Pollutive			
Hazardous/ Non-pollutive			
	Developed	1.12	1.13
	Developing	0.59	0.63
Non-Hazardous/Non-pollutive			
	Developed	0.74	0.74
	Developing	2.00	1.84

Notes: 1. Classification based from Environment Management Bureau (EMB) based on Medalla (2001).
2. Total export is the sum of developed and developing countries exports. This excludes data from least developed countries (LDCs).
Source of basic data: PC-TAS (SITC).

Table 3 provides additional information on the share of the product group by pollution classification for developed and developing countries. Consistent with their revealed comparative advantage, developed countries export a larger share of pollutive industries at around 70 percent of their total exports.

Table 3. Share of product group by pollution classiffication in total exports, per country group (1996-2000)

Pollution Classification		1996	share	1997	share	1998	share	1999	share	2000	share	average share
Total Exports	World											
	Developed	**3,318**	100	**3,412**	100	**3,407**	100	**3,462**	100	**3,713**	100	100
	Developing	**983**	100	**1,067**	100	**1,024**	100	**1,107**	100	**1,349**	100	100
All Pollutive	**World**	**3,044**		**3,155**		**3,131**		**3,208**		**3,522**		
	Developed	**2,368**	**71**	**2,426**	**71**	**2,436**	**72**	**2,466**	**71**	**2,604**	**70**	71
	Developing	**562**	**57**	**608**	**57**	**576**	**56**	**624**	**56**	**770**	**57**	56.6
All Hazardous	World	1,873		1,952		1,980		2,002		2,142		
	Developed	1,516	46	1,563	46	1,589	47	1,590	46	1,649	44	45.8
	Developing	302	31	328	31	325	32	344	31	415	31	31.2
Extremely Hazardous	World	611		628		573		614		770		
	Developed	415	13	423	12	404	12	415	12	481	13	12.4
	Developing	150	15	158	15	131	13	160	14	230	17	14.8
				0		0		0		0		
All Non-Pollutive	**World**	**470**		**491**		**484**		**478**		**508**		
	Developed	**302**	**9**	**308**	**9**	**300**	**9**	**297**	**9**	**308**	**8**	8.8
	Developing	**154**	**16**	**168**	**16**	**168**	**16**	**164**	**15**	**183**	**14**	15.4

Notes: 1. Classification based from Environment Management Bureau (EMB) based on Medalla (2001).

2. Value in billion US$ and Share in %

3. Shares of developed and developing may not add to up to 100% since trade data of least developed countries (LDCs) et al are not classified/included as developing.

Source of basic data: PC-TAS (SITC).

Trade performance of selected pollution intensive products

The analysis above lumped industries together under the major categories of pollution classification. To get a better picture of exports of pollution intensive products, an attempt is made below to look at more specific sectors. Pollution intensive industries are defined as industries characterized by high levels of toxic release after efforts have been made to control the pollution and/or high levels of pollution abatement costs, compared with other industries.[11] (Jenkins et al 2002) Accordingly, pollution-intensive industries were selected to include those with above-average pollution abatement costs as a percentage of total costs. Table 4 shows the industries and corresponding SITC trade categories with the highest abatement costs (calculated by Low for United States industries with at least 1.8%).

Table 4. Classification of Pollution-Intensive Industries

Industry	SITC No.	Description
Industrial chemicals	51	Organic chemicals
	52	Inorganic chemicals
	562	Manufactured fertilisers
	59	Other chemical material and products
Paper and pulp	251	Pulp and waste paper
	641	Paper and paperboard
	642	Articles of cut paper and board
Non-metallic minerals	66	Non-metallic mineral manufactures
Iron and steel	67	Iron and steel

[11] The most common approach towards identifying pollution intensive-industries are those industries which have a relatively high share of pollution abatement costs in total costs or relative to their turnover. Another approach considers the volume of pollution generated by an industry per dollar of output or value added, or per person employed.

Non-ferrous metals	681	Silver and platinum
	682	Copper
	683	Nickel
	685	Lead
	686	Zinc
	687	Tin
	689	Other non-ferrous base metal

Notes: SITC Rev. 3. Selection of industries based on Low's (1992) classifications.
Adopted from Busse 2004.

The findings are generally the same. Figures 1-5 show that over the past decade, exports and imports of pollution-intensive products are dominated by developed countries. A much larger share of these products are exported by developed countries. Similarly, imports of these products are concentrated in the developed countries. With respect to developing countries, the general pattern is that they import more than export these pollution intensive products with the exception of minerals both non-metallic and non-ferrous. Indeed, data seem to reject the assertion that polluting industries have migrated from developed to developing countries, although there are of course exceptions.

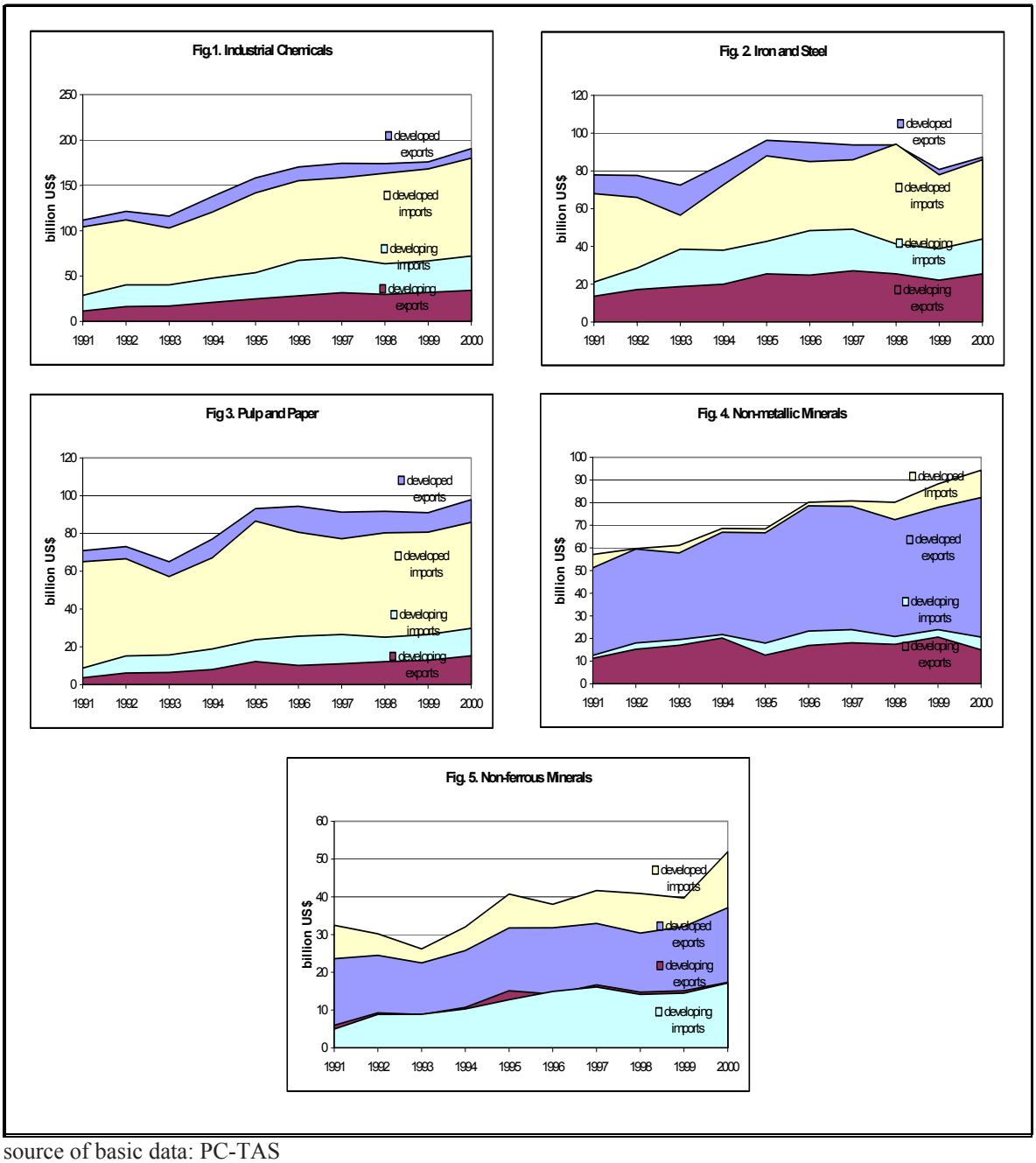
For almost all of these industries, the shares for developed countries did not changed significantly during the last decade. However, the share in trade of pollution-intensive products from 1991 to 2000 has grown somewhat for developing countries. Nevertheless, the share is much higher for imports compared to exports. (Table 5) This, again follows the revealed comparative advantage index to the country groups. Although relative RCA index is increasing in favor of developing countries, developed countries have generally a higher RCAS index in the industry-levels with the exception of iron and steel[12] and non-ferrous metals. (Table 6)

- *Is there evidence of international competition in attracting polluting industries?*

Evidence based on the pollution-intensity of trade does not seem to support the perception that developing countries are gaining a comparative advantage in pollution-intensive production because of lax environmental regulations. The tendency, at least in the last decade, is rather that developed countries are strengthening their position in polluting industries, which suggests that classical factors of comparative advantages predominate over differential environmental standards. This is not surprising, since polluting industries tend to be very capital intensive, and since abatement costs, even in countries with the most stringent regulations, represent only a small percentage of production costs. (WTO 1999)

[12] This has the same findings with Busse (2004).

Figures 1-5. Trade Structure of Pollution-Intensive Products



source of basic data: PC-TAS

Table 5. Trade share of selected pollution-intensity products, per country group 1991-2000 (%)

Reporter	1991		1994		1997		2000	
	Export	Import	Export	Import	Export	Import	Export	Import
Industrial Chemicals								
Developed	90.65	78.39	86.77	71.68	81.41	67.19	81.74	69.47
Developing	9.35	21.61	13.23	28.32	14.85	29.88	14.74	27.84
Iron and Steel								
Developed	85.03	76.29	80.73	65.66	69.88	60.93	69.86	62.58
Developing	14.97	23.71	19.27	34.34	20.25	34.86	20.42	32.03
Non-ferrous Metals								
Developed	79.81	86.74	70.62	75.63	60.02	70.77	62.16	73.8
Developing	20.19	13.26	29.38	24.37	30.43	27.35	29.07	24.35
Non-metallic Metals								
Developed	82.05	82.02	76.77	75.94	78.68	74.94	81.62	79.77
Developing	17.95	17.98	23.23	24.06	18.23	22.22	14.88	17.43
Paper and Pulp								
Developed	95.19	88.21	90.62	78.04	86.69	71.32	83.61	71.24
Developing	4.81	11.79	9.38	21.96	10.45	24.52	12.97	24.64
Total								
Developed	87.94	81.13	83.04	72.55	77.4	68.13	77.89	70.59
Developing	12.06	18.87	16.96	27.45	17.24	28.57	16.9	26.02

Notes: For 1991-1994, share is computed from the sum of developed and developing countries. For 1997-2000, share may not tally because actual world trade data is used.

Source of data: PC-TAS (SITC)

Table 6. Revealed Comparative Advantage per product classification

Reporter	1991	2000
Industrial Chemicals		
Developed	1.08	1.00
Developing	0.59	0.98
Iron and Steel		
Developed	1.01	0.92
Developing	0.95	1.45
Non-ferrous Metals		
Developed	0.95	0.81
Developing	1.28	2.04
Non-metallic Minerals		
Developed	0.97	1.00
Developing	1.14	0.99
Paper and Pulp		
Developed	1.13	1.03
Developing	0.31	0.86

Notes: classification based from Low. Total trade is the sum of developing and developing countries exports.

source of basic data: PC-TAS (SITC)

IV. Some Observations on Environmental Regulations and International Trade

The potential impacts of trade and trade policy on the environment are well-recognized. The effects are reflected on several levels: mainly in terms of scale, structure, product, technology and regulation. (Box 1) The effects may be positive or negative. Indeed, studies have shown that on the whole, the impact of trade liberalization on the environment is generally positive, especially if it is accompanied by effective environmental policies. As trade liberalization improves the efficient allocation of resources, promotes economic growth and increases general welfare, it increasingly acts as a positive agent, which could provide resources for environmental improvement.

Box 1. Five Main Environmental Effects of Trade Liberalization

Scale effects : these are associated with the overall level of economic activity resulting from trade liberalization. Positive scale effects may result from higher economic growth particularly when appropriate environmental policies are present. Negative scale effects may occur when higher economic growth bring increased pollution and faster draw-down of resources due to the absence of appropriate environmental policies.

Structural effects : these are associated with changes in the patterns of economic activity resulting from trade liberalization. Positive structural effects may result when trade liberalization promotes an efficient allocation of resources and efficient patterns of consumption. Negative structural effects may occur when appropriate environmental policies do not accompany changes in patterns of economic activity.

Product effects : These are associated with trade in specific products which can enhance or harm the environment. Positive product effects may result from increased trade in goods which are environmentally-beneficial like energy-efficient machinery while negative product effects may result from increased trade in goods which are environmentally-sensitive like hazardous wastes.

Technology effects : These are associated with changes in the way products are made depending on the technology used. Positive technology effects may result when the output of pollution per unit of economic product is reduced.

Regulatory effects : These are associated with the legal and policy effects of trade liberalization on environmental regulations, standards and other measures.

Source: OECD 1994/1995 from Aldaba and Cororaton 2001.

At the same time, environmental regulation would also have effects on trade, both positive and negative. The most common negative implication of a national environmental regulation would be increased costs (from complying with environmental regulations) and a limitation of the market access.

Nevertheless, good environmental regulation could also have a positive impact on trade. An increase in the burden of environmental taxation spurs innovation because it increases the market share of recent vintages. A restrictive environmental policy affects economic growth through two channels of transmission that operate in two opposite directions: the first channel lowers the marginal impact of innovation on productivity growth, while the second channel spurs innovation. The second channel is unlikely to dominate unless R&D labs have little scope for reducing pollution intensity. In any case, when carrying out cost-benefit analyses of environmental policy, its cost in terms of

slower growth is reduced once this distortionary impact of policy on competition across vintages is taken into account. (Ricci 2004)

The trade consideration is apparent in the growing development of environmental policy, which even to some extent make use of market instruments. While pollution control policies are currently enforced using the traditional command and control principle, a paradigm shift to a market-based approach is gaining acceptance and policy instruments are already being put in place. Examples of market-based instruments (MBIs) include pollution charges, environmental subsidies, deposit-refund systems and tradable permits. In the best of all worlds, governments would use proper environmental polices to "internalize" the full environmental costs of production and consumption-the "Polluter Pays Principle" (Box 2)

Box 2. Differentiating government environmental regulation approaches	
Command and control principle In a "command and control regime," the government enforces regulatory measures and permit requirements to control activities causing environmental pollution. Environmental quality standards prescribe the allowable and acceptable level of pollutants with fine and penalties for noncompliance. Policies are now shifting from this dominant approach to more market-based instruments for economic and technical arguments.	*"Polluter pays" principle* The "polluter pays" principle aims at ensuring that the costs of environmental control fall in the first place on the polluters, thereby ensuring that market forces take these costs into account and that resources would be allocated accordingly in production and consumption.

Table 7 shows the summary of environmental laws/regulations of selected developing countries within the APEC region. The existence of relevant legislations on various sectors as well as environmental impact assessment systems negates the “race to the bottom” hypothesis as environmental concern remains one of the top priorities in the overall planning of developing countries. There is adequacy of laws in these countries. (Future studies could look into the standards use, whether low or high and the extent of implementation and/or enforcements of these laws)

Although there is a growing significance of environmental regulation, the lack of law does not necessarily mean pollution intensity. In the case of Indonesia, the price of pollution is determined by the intersection of plant level demand and a local environmental supply function, enforced by community pressure or informal regulation. Pollution intensity declines with increases in plant size, efficiency, and local materials prices. Older plants and publicly owned facilities are more pollution intensive; multinational ownership has no independent effect. The results also suggest that the price of pollution is higher when plants are particularly visible and is far lower in poorer, less educated communities. While it would be premature to generalize from these results, they suggest that the model of optimal pollution control in environmental economics is more relevant for developing countries than many have believed. Community factory interactions seem to reflect environmental supply demand considerations even when formal regulation does not exist.[13] (Pargal and Wheller 1995)

[13] Evidence from developing countries suggests that local communities can sometimes exert effective pressure on firms to clean up their act even without the backing of formal regulations and laws.

Second, even if no regulations are imposed, whether formally or informally, it may still be in the interests of firms to make at least a minimum of effort to control pollution so as to safeguard their reputation, to avoid consumer boycotts in environmentally conscious (export) markets, and to reduce the risk of legal liabilities, should a major environmental accident occur. Another indication of increasing readiness to assume greater environmental responsibilities is the rapid adoption of voluntary environmental management standards (ISO 14000) promulgated by the International Organization for Standardization (ISO). In addition to the market pressure exerted by the growing number of environmentally conscious consumers, the financial community has its own reasons for ensuring that the firms they bankroll or own do not have a poor environmental profile. (WTO 1999)

Table 7. Existing Environmental Regulations of Selected (APEC) Developing Countries

Country	National Policy on Environment	EIA	Agency	Existing Legislations/ Government Regulations			
				Air Pollution	Ambient Air Standards/ Emission Standards	Water Pollution	Hazardous Waste
Chile	Seven Principles: Basic Law for the Environment (1994)	Environmental Impact Assessment System described.	National Commission on the Environment (CONAMA)	Supreme Decree 4 regulating stationary sources, Supreme Decree 185 regulating SO2, arsenic and particles from large sources, Supreme Decree 211 regulating vehicular sources	Resolution No1215, Ministry of Health, SD, No59, SD, 185	Water Code, Mining Code	Sanitary Code, Municipal Ordinance; Low No3133 (1916)
China	Environmental planning in the Ninth Five years (namely the 2010 long term planning)	National laws and regulations related with EIA; Managing ordinances on protecting environments of construction project	State Environmental Resource Committee (SERC); State environmental protection administration (SEPA)	The prevention and cure law of the People's Republic of China on air pollution (amended), adopted by the National People's Congress on 29th April 2000	Air environment quality standard GB 3095-1982, promulgated by the State Environmental Protection Administration (SEPA) Ambient air quality standard GB 3095-1996, promulgated by SEPA	Law of the People's Republic of China on prevention and cure of Water Pollution (amended), promulgated by the National People's Congress in May 1996	
Indonesia	Indonesia Agenda 21 (1997)	Various activities required EAI	Ministry of Environmen (MenLH); Environmental Impact Management Agency (BAPEDAL)	Standard Air Pollution Index; Blue Sky Program	Emission Standards for motorized vehicle	Water Pollution Control	Hazardous and Toxic Waste Management
Malaysia	National Environmental Action Plan (NEAP); Local Agenda 21 for Malaysia (2002)	Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order, 1987	Department of Environment, Ministry of Science, Technology and Environment (MOSTE)	Environmental Quality (Clean Air) Regulations / 1978 Environmental Quality (Control of Lead Concentration in Motor Gasoline) Regulations / 1985 Motor Vehicle (Control of Smoke and Gas Emission) Rules / 1978	Environmental Quality (Control of Lead Concentration in Motor Gasoline) Regulations, 1985	Environmental Quality (Sewage and Industrial Effluents) Regulations, 1979.	Environmental Quality (Prescribed Premises) (Scheduled Wastes Treatment and Disposal Facilities) Order, 1989.
Mexico	Programa del Medio Ambiente (Environment Program) 1995-2000	Regulation for the implementation of General Law for Ecological Equilibrium and Environmental Protection	Ministry of Environment, Natural Resources and Fishery	Regulation on Environmental Impact Regulation on Prevention and Management of Pollution from Vehicles in the Federal District and the Metropolitan Area	Mexican Official Standards (NOM)	National Water Resource Law	General Law for Ecological Equilibrium and Environmental Protection Regulation on Hazardous Waste, Mexican Official Standards (NOM)
Papua New Guinea	Managing Papua New Guinea's Unique Environment Strategic Directions 1996-1998	EIA is essentially a preventive process. EIA and resource planning are together a total approach to environmental management.	Department of Environment and Conservation (DEC)	Summary Offences Act; Environment Act/2000	Environment Planning Act	Water Resource Act	Environment Contaminant Act
Peru	Environmental Code and Natural Resources	Environmental Protection Standards for Industry - Supreme Decree No. 011-97-ITIBCI, January 5, 1997	There is no governmental office exclusively in charge of environmental management.	Environmental Code and Natural Resources(Legislative Decree No. 613); Electricity Regulation (Supreme Decree No. 29-94-EM); Hydrocarbon Regulation (Supreme Decree No. 046-93-EM); Mining Regulation (Supreme Decree No. 016-93-EM)	Environmental Code and Natural Resources (Legislative Decree No. 613)	Environmental Code and Natural Resources (Legislative Decree No. 613); Mining Regulation (Supreme Decree No. 016-93-EM); Environmental Protection from Mining (Supreme Decree No. 016-93-EM)	Environmental Protection Standards for Industry (Supreme Decree No. 011-97-ITIBCI, January 5, 1997) Regulations for Environmental Protection from Mining Activities (Supreme Decree No. 016-93-EM. enacted May 1, 1993)
Philippines	National Action Plan for Sustainable Development, Philippine Agenda 21 (PA21) 1996; Medium-Term Development Plan	Environmental Impact Statement System. of P.D. 1586. The System requires proponents of environmentally critical projects (ECPs) in environmentally critical areas (ECAs) to secure an Environmental Clearance Certificate (ECC) prior to construction.	Department of Natural Resources and Environment - Environment Management Bureau	R.A. No. 8749 - Philippine Clean Air Act of 1999; P.D. 984 - Pollution Control Law	P.D. 1152 -Establishing Air Quality to Protect Public Health and Damage to Living Things and Property; P.D. 1181 - Air Pollution from Motor Vehicles DAO 14 AND 14-A of 1993	PD 1067, Water Code of the Philippines (1976); PD 984, Pollution Control Law	R.A. 6969, Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990
Thailand	Policy and Prospective Plan for Enhancement and Conservation of National Environmental Quality, B.E. 2543-2559 (1997 – 2016)	Office of Environmental Policy and Planning announce regulations (on EIA Expert qualification and EIA licensing) of Section 19 and Section 28 of the Enchantment and Conservation of National Environmental Quality Act (NEQA), 1975, which was supplemente	National Environmental Board; Office of Environmental Policy and Planning, MOSTE	National Environmental Quality Act, 1992	Notification of the National Environmental Board, No. 10, 1995; Notification of the Ministry of Industry	National Environmental Quality Act, 1992	National Environmental Quality Act, 1992; Hazardous Substances Act, 1992

Source: JICA Country Profile on Environment, 1999-2000, various reports.

V. Environment in the Multilateral Trade Agenda

Countries act individually through their national policies and implementation to solve environmental problems. However, because of the linkage between trade and environment, environmental effects and issues spill across border. In addition, there are cases of global environmental goods (global commons). Hence the need for multilateral institutions.

When the international trading system was reconstructed after the Second World War, the environmental consequence of economic integration was not a primary concern.[14] Nevertheless, if environmental issues had a low priority during the first four decades of the GATT, they came back with a vengeance in the early 1990s. The starting point of the current debate was a series of contentious environmentally- related trade disputes, especially the "tuna-dolphin" dispute between Mexico and the United States.[15] With the formation of the WTO in 1995, environmental issues, as they relate to trade, are now firmly anchored in the multilateral trading system. (Box 3) The Doha Round will be the first WTO round to deal with environmental concerns as an official issue (WTO 1999) Whether or not to include the environmental agenda in the already organized and structured multilateral WTO is a relevant and controversial question.

Box 3. The Green provisions in the WTO

Examples of provisions in the WTO agreements dealing with environmental issues are as follows:

GATT Article 20: policies affecting trade in goods for protecting human, animal or plant life or health are exempt from normal GATT disciplines under certain conditions.
Technical Barriers to Trade (i.e. product and industrial standards), and **Sanitary and Phytosanitary Measures** (animal and plant health and hygiene): explicit recognition of environmental objectives.
Agriculture: environmental programmes exempt from cuts in subsidies
Subsidies and Countervail: allows subsidies, up to 20% of firms' costs, for adapting to new environmental laws.
Intellectual property: governments can refuse to issue patents that threaten human, animal or plant life or health, or risk serious damage to the environment (TRIPS Article 27).
GATS Article 14: policies affecting trade in services for protecting human, animal or plant life or health are exempt from normal GATS disciplines under certain conditions.

Recurring Issues

- *Are calls for environmental protection a disguised form of protectionism?*

[14] Only indirect references to the environment were included in the exception clause of GATT 1947, Article XX, which allows countries to sidestep the normal trading rules if necessary to protect human, animal plant life or health, or to conserve exhaustible natural resources, provided that such measures do not discriminate between sources of imports or constitute a disguised restriction on international trade.

[15] While this ruling in this case was never adopted by the GATT Council, and hence is not legally binding on the parties, it was viewed by the environmental community as a threat to environmental policy making in general, and the use of trade measures to support environmental objectives in particular, including the legal status of trade-provisions in multilateral environmental agreements (MEAs).

While trade measures are rarely, if ever, the first-best policy for addressing environmental problems, governments have found trade measures a useful mechanism for encouraging participation in and enforcement of multilateral environmental agreements in some instances, and for attempting to modify the behaviour of foreign governments in others.

One reason why the WTO seems to have become the focal point for environmental disputes (Box 4)—inspite of the fact that environmental issues, with the exception of trade-related aspects, are by and large outside its mandate—is presumably because the WTO, unlike many other international institutions, has an integrated adjudication mechanism backed by trade sanctions as the ultimate enforcement tool. (WTO 1999)

Box 4. A disguised restriction on international trade? - A note from WTO dispute settlement decisions

The question of whether a measure constitutes a disguised restriction on international trade has been studied by several panel and Appellate Body reports, and in particular detail by the panel in the EC – Asbestos case. Three criteria have been progressively introduced in order to determine whether a measure is a disguised restriction on international trade: (i) the publicity test, (ii) the consideration of whether the application of a measure also amounts to arbitrary or unjustifiable discrimination, and (iii) the examination of "the design, architecture and revealing structure" of the measure at issue.

(i) In the *US – Canadian Tuna* case, the panel adopted a literal interpretation of the concept of "disguised restriction on international trade" only based on a publicity test. It felt that "the United States' action should not be considered to be a disguised restriction on international trade, noting that the United States' prohibition of imports of tuna and tuna products from Canada had been taken as a trade measure and publicly announced as such".

In the *US – Gasoline* case, the Appellate Body considered however that it was "clear that *concealed* or *unannounced* restriction or discrimination in international trade does *not* exhaust the meaning of 'disguised restriction'". The panel in the *EC – Asbestos* case interpreted this sentence as implying that a measure that was not published would not satisfy the requirements of the second proposition of the introductory clause of Article XX. The panel noted that the French decree applies unequivocally to international trade, since as far as asbestos is concerned both importation and exportation are prohibited. In this sense, the criteria developed in *United States – Tuna (1982)* and in *United States – Automotive Springs* have already been satisfied. The panel further observed that this remark also suggests that the expression "disguised restriction on international trade" covers others requirements than the sole publicity test.

(ii) In the *US – Gasoline* case, the Appellate Body also considered that the kinds of considerations pertinent in deciding whether the application of a particular measure amounts to "arbitrary or unjustifiable discrimination" may also be taken into account in determining the presence of a "disguised restriction on international trade":

> "'Arbitrary discrimination', 'unjustifiable discrimination' and 'disguised restriction' on international trade may, accordingly, be read side-by-side; they impart meaning to one another. It is clear to us that 'disguised restriction' includes disguised *discrimination* in international trade (…). We consider that 'disguised restriction', whatever else it covers, may properly be read as embracing restrictions amounting to arbitrary or unjustifiable discrimination in international trade taken under the guise of a measure formally within the terms of an exception listed in Article XX".

(iii) Another requirement was taken into account by the Appellate Body in *US – Shrimp* and by the panel in the *EC – Asbestos* case. In *EC – Asbestos*, after finding that the measure at issue met the publicity criterion, the panel examined as an additional requirement the "design, architecture

and revealing structure" of the measure as it had already been introduced in *Japan – Alcoholic Beverages* in order to discern the protective application of a measure.

The panel then concluded that "[a]s far as the design, architecture and revealing structure of the Decree are concerned, we find nothing that might lead us to conclude that the Decree has protectionist objectives". Similarly in the *US – Shrimp* case, the panel demonstrated that the measure at issue did not constitute a disguised restriction on international trade by examining the "design, architecture and revealing structure" of the measure.

Note: Footnotes omitted for brevity.
Source: WTO (2002)

Perceptions that WTO Panel rulings have interfered with the ability of individual countries to pursue environmental goals are 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), as long as the measures do not discriminate among producer countries. (Frankel 2003)

- *Is there a conflict between development and commonly proposed global environmental measures?*

Setting Multilateral Trade Standards

First of all, negotiations in multilateral trade agreements will have to be characterized by more balanced and equitable participation of developed and developing countries. (IISD 2000)

The development of the environmental agenda in trade negotiations would depend on the interest and motivations of each Member state and hence the need to examine the driving forces behind it. The aim of the European Union for instance in securing agreement to include environment is to legitimize trade sanctions to impose environmental policies extraterritorially. This reflects the disposition of the EU's institutions of government to prefer centralized command and control rather than the free market policies and the subsidiarity principle as a means of improving the environment. This brings about the fear of a weakening of the WTO's free market structures in the pursuit of still a poor environmental policy. (Oxley 2002)

Although in general, economists recognize four fundamental principles[16] when pondering the negotiation of a set of multilateral standards to restrain government action the environmental issues, it is said that only in the first principle will the WTO necessarily becomes involved, as any direct impact on trade favors (or implicates) an agreement at the multilateral level. In particular, a meaningful trade dispute resolution for environmental issues is very difficult to implement. (Maskus 2000 in Busse 2004)

[16] (1) The issue is clearly trade related such that trade flows are distorted; (2) there are international externalities, such as environmental spillovers, involved that limit the attainment of global optimality, and multilateral rules are an appropriate way to internalize those externalities; (3) in the case of no multilateral rules, national governments would choose sub-optimal policies that result in insufficient regulations or a "race to the bottom" on regulations; and (4) any damages from not complying with international regulations can be assessed in financial terms and, thus, allow the dispute settlement to function.

There is a growing sentiment that environmental standards should not necessarily be harmonized across locations, whether nationally or internationally. There could be some rationale for harmonizing standards across locations where the *same* conditions apply, taking into account that different nations may put different values on environmental amenities even if ecological conditions are identical. However, this conclusion refers only to *local* pollution problems that are arguably best addressed by standards targeted to the specificities of the local conditions. The case is different for *transboundary* and global problems where policy harmonization and collective management of common resources is perhaps the only feasible option. (WTO 1999)

Likewise important to note is that although national standards (as defined by laws and regulations) are uniform, their implementation is a function of local conditions. Local monitoring and enforcement of national standards effectively determines the "price of pollution "in each area -- Which means that, all things being equal, local enforcers could redirect resources in a way that approximates optimal behavior. Ignoring the trade-offs taking place locally could undermine and render ineffective regulatory and policy reform that is strictly national. (Dion et al 1997)

- *The WTO and MEAs conflict*

There are approximately 200 multilateral environmental agreements (MEAs) in place today. Only about 20 of these contain trade provisions. For example, the Montreal Protocol for the protection of the ozone layer applies restrictions on the production, consumption and export of aerosols containing chlorofluorocarbons (CFCs). The Basel Convention, which controls trade or transportation of hazardous waste across international borders, and the Convention on International Trade in Endangered Species (CITES) are other multilateral environmental agreements containing trade provisions. (See Appendix Table 2)

Whereas the WTO has always held sustainable development to be a principle of trade liberalization, it has had to face a rising number of MEAs that often conflict with WTO principles. In these significant MEAs parties are obliged to use trade bans to enforce the environmental objectives of the treaties, and are required to ban trade with countries which are not parties to the MEAs. The WTO however does not permit any member to impose its own policies extraterritoriality under the threat of trade bans (the MEAs say we will not trade with you unless you apply our policies and standards) and it does not permit members of the WTO to discriminate amongst each other in their trade policies. (Oxley 2002) So also in the case of MEAs, the proliferation of amendments, protocols or annexes to various MEAs not only keeps the Party – non-Party nexus alive, but also might make it more subtle and confusing. (Hoffman 2003)

At present, the WTO has the burden of resolving the relationship between environmental regulation and trade in the middle of a highly controversial trade battle on the subject of genetically modified organisms between the European Union and the United States. (Busse 2004)

There seems to be a lack of balance in the discussions on trade and environment and this has led developing countries to adopt defensive postures in international debates. For example, discussions have focused largely on issues such as the need to accommodate

trade measures pursuant to multilateral environmental agreements (MEAs) as well as eco-labelling based on non-product related PPMs. (Box 5) “Developing country issues", such as safeguarding and further improving market access, controlling export of domestically prohibited goods and promoting technology transfer appear to have received far less attention. Thus, while in the developed countries there is pressure to accommodate the use of trade measures for environmental purposes within the framework of WTO rules, it appears that there is no concomitant effort to actually control exports of environmentally harmful products and obsolete technologies to developing countries. (Jha and Vossenaar 1999)

Box 5. How the WTO relates to environmental agreements?

At Doha, Members agreed to launch negotiations on the linkage between trade and environment. However, these negotiations are circumscribed to four issues: the need to clarify the relationship between existing WTO rules and specific trade obligations set out in multilateral environmental agreements (MEAs); the exchange of information between the WTO and MEA secretariats; the criteria for granting observer status to other international organizations; and the liberalization of trade in environmental goods and services.

How do WTO rules apply to WTO members that have also signed environmental agreements outside the WTO? Suppose a WTO member government puts into place a trade measure to protect its environment that is provided for in an environmental agreement that it has signed. Should it fear being challenged in the WTO dispute settlement procedure? The new negotiations aim to clarify the relationship between trade measures taken under the environmental agreements and WTO rules.

Focus on actual obligations, or broader principles? Some members advocate identifying individual “specific trade obligations” that the WTO should examine. Others prefer a more general approach that would look at the principles governing the relationship between the WTO and the environmental agreements, and how the environmental agreements’ trade measures might be accommodated in the WTO. For example, some advocate the principle that there should be no “hierarchical” relationship between the two legal regimes—neither the WTO, nor the environmental agreements should be dominant.

In the meantime, proposals to grant observer status in the WTO to other international governmental organizations are currently blocked for political reasons. In the Trade and Environment Committee’s special sessions, eight requests are pending, including four from multilateral environmental agreements. The negotiations aim at developing criteria for allowing these organizations to be observers in the WTO.

Source: Abridged from WTO Briefing Notes on Trade and Environment. WTO website.

Perceived Solution

Apart from WTO provisions or MEAs, probably the best way to address environmental issues is to remove obstacles to incomplete markets. The vast majority of environmental degradation can be attributed to situations in which environmental resources are not properly valued, leading to so-called positive or negative externalities. Above all, these arise due to inefficient property rights systems, imperfect or asymmetric information, and government failure, where government policy focuses more on special interest groups rather then the general public. (Busse 2004)

Technical cooperation is the key to achieving the objectives of these agreements. This should start with the integration of tested-environmental programmes say from developed countries to developing countries at a gradual rate that would not be hurtful in the adjustment of the industries. Coordination can be had among the donors-government-private sector and civil society groups. (Audley and Ulmer 2003)

Developing countries also lack capacity to build credible certification bodies with the result that their firms often encounter problems in certifying compliance with international standards. Enforcing environmental standards and norms and monitoring them is also an enormous problem for developing countries. (Jha and Vossenaar 1999)

So long as good environmental policy is in place and adequately enforced, whatever trade and industrial policy adopted would not impose undue burden on the environment. In other words, trade policy should not be used for environmental objectives. Rather, the problem should be dealt with at its source—environmental regulation for environmental objectives and the best economic policy for economic objectives. (Medalla 2001)

Other Prospects

- *Advent of Environmental Goods*

According to Bora and Teh (2004), there is a negative (i.e., $\alpha 4 < 0$) and statistically significant link between trade and environment. Countries which trade more environmental goods have less pollution or consume energy more efficiently. This holds whether the OECD or APEC list is chosen as the explanatory variable in the regressions.

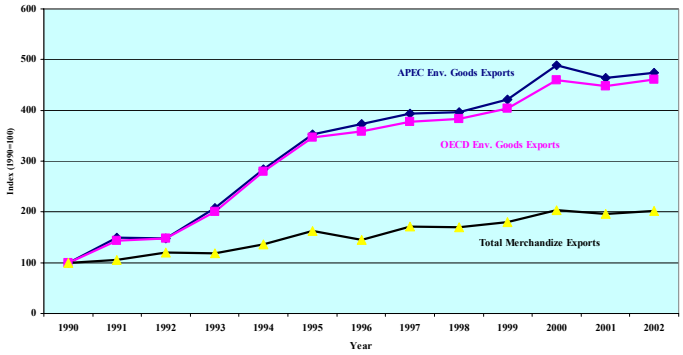
In 2002, total exports of environmental goods amounted to about $ 238.4 ($ 215.3) billion when one uses the OECD (APEC) defined list, representing between 3.6 to 4.0 per cent of world exports. But in the past dozen years (1990-2002), trade in environmental goods has grown more than twice as fast (14%) as total merchandise trade (6%). Developed countries make up 79% of environmental goods exports; developing countries about 20%; and LDCS less than 1%. Developed countries make up 60% of environmental goods imports; developed countries 39%; and LDCs less than 1%.[17] (Figure 6) The factors fuelling this dynamism include the greater awareness of the value of the environment and concern about pollution as well as institutionalization of environmental protection in countries around the globe (series of OECD country studies). (Bora and Teh 2004) On the other hand, analyzing the trend in the industry, there is the risk of primarily focusing trade liberalization on products integrated in "end of pipe" equipment. (Drouet 2004)

What remains to be a problem is that on environmental goods, there is no clear agreement among WTO Members on definitions and coverage of such goods despite

[17] Western Europe alone accounted for almost half of environmental goods exports and is a net exporter whether the APEC or OECD definition is used. Asia is the second largest trader of environmental goods and is a net importer whether the APEC or OECD definition is used. North America is a net exporter only if the APEC definition is used. All the other regions are net importers of environmental goods, whichever definition is used.

reference to definition of environment industry by the OECD as "activities which produce goods and services to measure, prevent, limit, or minimise or correct environmental damage to water, air and soil, as well as problems related to waste, noise and ecosystems." (Sugathan 2004)

Figure 6. Growth of environmental goods trade, 1990-2002



- *Environmental Service*

Environmental services are one segment of the environmental industry. Trade in environmental services appears to be relatively free of restrictions in comparison with other service sectors. The current GATS classification of environmental services fails to account for the present regulatory reality and for how business operates in this sector. A new possible classification of the sector would therefore have to address the issue of the so-called "non-core" environmental services or services with "dual use".

Nearly 50 member countries of the WTO have made commitments on environmental services in the context of GATS, but they include those that are the major players in the international markets. The majority of commitments have been made by developed and East European countries (20). Only two commitments are scheduled by countries from the Asian region and two from Latin America. The remaining commitments have been made by countries from Africa. Notably, no limitations on foreign investment have been included in the specific commitments. (Butkeviciene 2004)

- *Eco-labeling*

Another approach that has been discussed to address environmental degradation of individual firms or countries is eco-labeling schemes. An eco-label is a form of **legally protected label** that is applied to (or certification awarded to) a product or service, warranting that it complies with certain pre-determined environmental and (sometimes) social criteria. Eco-labels are policy instruments that attempt to communicate distinctions in similar products based on their relative environmental impact. (Naumann 2001)

There are a number of national and private eco-labelling schemes in existence worldwide. (Table 8) Most eco-labelling schemes were developed in the early 1990s, and new product categories are being added continuously.

Product labeling requires that (imported) goods be correctly distinguished by labels that state, for instance, that the product has been produced without, or with very little, environmental degradation. Consumers in industrial countries might be ready to pay a higher price for improved standards. This approach could also lessen concerns about low standards expressed by trade unions (in high-income countries) and non-governmental organizations and could provide an incentive for firms in the exporting nations to upgrade their standards without binding rules. In particular the voluntary participation of all parties involved is the most appealing argument for labeling, as it allows the willingness-to-pay rule to decide the level of harmonization of environmental standards and avoids internationally binding trade restrictions. (Busse 2004)

Table 8.

Table 2: Overview of National Eco-Labelling Programmes and their Dates of Creation

Country / Group	Name of Eco-Labelling Programme	Date of Creation
Germany	Blue Angel	1977
Canada	Environmental Choice Programme	1988
Japan	Eco Mark	1989
Nordic Countries	Nordic Swan	1989
United States	Green Seal	1989
Sweden	Good Environmental Choice	1990
India	Ecomark	1991
Austria	Austrian Eco-Label	1991
Australia	Environmental Choice	1991
Rep. of Korea	Ecomark	1992
Singapore	Green Label Singapore	1992
France	NF-Environnement	1992
Netherlands	Stichting Milieukeur	1992
European Union	**European Flower**	**1992**
Croatia	Environmentally Friendly	1993
Thailand	Thai Green Label	1994

Source: Table 2, Naumann 2001.

Notwithstanding these clear advantages, there are also important problems involved with labeling: First, due to the likely premium on commodities with higher standards, labeling might create incentives for private firms to overstate the standards by which they abide. Second, it might be doubtful whether eco-labeling for iron and steel products is an appropriate way to deal with the negative linkages between environmental regulations and comparative advantage. (Busse 2004)

One important inquiry is the implications of eco-labeling for developing countries. There is a concern that eco-labels are complex schemes developed by national authorities to limit foreign competition as labeling product groups often favours domestic products over foreign products and are not always compatible with many of the products in developing countries. To many developing countries, the current debate involving eco-labelling represents another form of industrialised countries blocking out developing

country exports. Developing countries fear that stricter product standards relating to environmental criteria are increasingly being used as a trade barrier for their exports, and that these environment-based restrictions are used as an indirect means of protecting "northern" industries. (Naumann 2001b)

In the medium to long-term, eco-labeling may thus have important consequences for market access in foreign countries where eco-labeling standards are well developed and have captured significant market share. Countries thus have the option of developing their own eco-labels, or their industries can focus on obtaining foreign eco-labels that are relevant in their current (or future) export markets. (Naumann 2001)

VI. Trade and Environment Policies in Tandem: the way forward

We go back to our fundamental hypothesis: there is no inherent conflict between adopting open trade policy and good environment policy. Indeed, it is ideal to have both. The conflict arises as a result of the failure of political institutions to address environmental problems, especially those of a global nature which require a concerted effort to solve. (WTO 1999) It is not trade *per se* which would lead to the "race to bottom" in the environmental regulations. It is more of the lack of awareness or prioritization of the environment as well as the laxity and incapability in the implementation of existing mechanisms which would have detrimental effects on the environment.

As earlier pointed out, developing countries may even be able to achieve high levels of economic growth and high levels of environmental performance even long before they reach the income levels of the industrialized countries. Nevertheless, this requires painstaking adjustments not only in the industry but national level as a whole including the consumers-end users.

This is not to say that there is no trade-offs between trade and environment. It is however a matter of implementing policies which results in correct pricing of goods and resources, including the environment. Too little and lax environmental regulations could bring about false comparative advantage, while too stringent regulations could erode real comparative advantage. There are no perfect policies, but these should at least be guided by sound principles.

The cost of environmental regulations should be reduced by special adjustment provisions as well as infrastructural support. There is a strong need for trade-related capacity building not only for environmental protection but to support sustainable development as a whole. Moreover, any environmental policy or capability-building program should reflect a country's absorptive capacity. It is only in this case that general welfare is optimized.

Aside from formal regulations, informal regulatory mechanisms coupled with local community education would prove to be effective and beneficial. Community pressure is one effective source of compliance and cooperation.

Finally, trade measures are seldom the *first best* policy tools to achieve environmental objectives, be it in the multilateral or regional context. What could be done

is to promote a “Race to the Top” like the so called “California Effect”[18] such that companies would be willing to meet the country’s higher standards not only to avoid losing the hold in the market but such that they could also easily meet the standards in the international arena.

[18] After the passage of the US 1970 Clean Air Act Amendments, California repeatedly adopted stricter emissions standards than other US states. Instead of a flight of investment and jobs from California, however, other states began adopting similar, tougher emissions standards. A self-reinforcing "race to the top" was thus put in place in which California helped lift standards throughout the US. Vogel (1995) attributes this largely to the "lure of green markets." (WB 2000)

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Appendix Table 1.List of Developed and Developing Countries

Developed	*Developing*	
Australia	Algeria	Kenya
Austria	Argentina	Korea Rep.
Belgium	Armenia	Kuwait
Belgium-Lux	Azerbaijan	Kyrgyzstan
Canada	Bahrain	Macau
Denmark	Bangladesh	Madagascar
Finland	Barbados	Malaysia
France	Benin	Maldives
Germany	Bhutan	Mali
Greece	Bolivia	Mauritius
Iceland	Brazil	Mexico
Ireland	Brunei Dar.	Morocco
Israel	Burundi	Mozambique
Italy	Cameroon	Nepal
Japan	Chile	Nicaragua
Malta	China	Niger
Netherlands	Colombia	Nigeria
New Zealand	Comoros	Oman
Norway	Costa Rica	Pakistan
Portugal	Cote Divoire	Panama
S.Afr.Cus.Un	Croatia	Papua N.Guin
South Africa	Cyprus	Paraguay
Spain	Dominica	Peru
Sweden	Dominican Rp	Philippines
Switz.Liecht	Ecuador	Qatar
Untd Kingdom	Egypt	Senegal
USA,Pr,Usvi	El Salvador	Singapore
	Ethiopia	Slovenia
	Gambia	Sri Lanka
	Georgia	Sudan
	Ghana	Suriname
	Grenada	Syria A. R.
	Guatemala	Tajikistan
	Guinea	Tanzania, U.R
	Haiti	Thailand
	Honduras	Trinidad Tbg
	Hong Kong	Tunisia
	India	Turkey
	Indonesia	Turkmenistan
	Iran (Islm.R)	Uganda
	Jamaica	Uruguay
	Jordan	Venezuela
	Kazakstan	Yugoslavia
		Zimbabwe

Appendix Table 2. MEAs with Trade Implications

MEA	Date in Force	Eligible Signatories	No of Signatories	Products affected
Wildlife Preservation	05/01/42	Americas	22	Migratory birds National Parks
Whaling Convention	11/10/48	All Countries	49	Whales
Bird Protect on	05/03/50	All Countries	15	Birds and bird eggs
Plant Protection	04/18/51	Europe, Mediterranean	34	Plants
Protection	07/02/56	SE Asia, Pacific	24	Plants, containers, soil, etc.
Quarantine of Plants	10/19/60	All Countries	8	Plants and weeds
Atlantic Tuna/ICCAT	03/21/69	All Countries	28	Tuna and tuna-like fish
Natural Resources	06/16/69	Africa	43	Soil water, flora and fauna resources
Animal Transport	02/20/71	Europe	22	Animals
Benelux Birds	07/01/72	Benelux	3	Birds
CITES	07/01/75	All Countries	152	Plants, animals threatened by trade
Polar Bears	05/26/76	Artic Countries	5	Polar Bears
Atlantic Fish	01/01/79	All Countries	19	Fish
Vicuna Convention	03/19/82	Andes	4	Vicuna
CCAMLR	04/07/82	All Countries	27	Antarctic Marine Living Resources
Tropical Timber	04/01/85	All Countries	54	Non-Coniferous tropical woods
Montreal Ozone Protocol	01/01/89	All Countries	175	Controlled substances that deplete ozone layer
Drift Nets	05/17/91	All Countries	15	Marine Living Resources
Basel Convention	05/05/92	All Countries	147	Hazardous waste production
Biological Diversity/CBD	12/29/93	All Countries	168	Conservation of biological diversity
Climate Change	03/21/94	All Countries	176	Six greenhouse gasses
Bluefin Tuna	05/20/94	Australia, Japan, NZ	3	Bluefin Tuna

Source: Annex 15. International Trade Centre (2004).