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Workshop 3: Pollution Havens and Pollution Halos

HAVENS, HALOS AND SPAGHETTI: UNTANGLING THE EVIDENCE ABOUT FOREIGN DIRECT INVESTMENT AND THE ENVIRONMENT

Lyuba Zarsky, Nautilus Institute for Security and Sustainable Development

EXECUTIVE SUMMARY

1. In the context of increasing globalisation of capital flows, the impact of foreign direct investment (FDI) on the environment is a topic of hot debate. Environmentalists have argued that gaps in national environmental standards draw the dirtiest OECD industries to developing countries, creating “pollution havens” and propelling a global “race to the bottom” in environmental standards. Free marketeers counter with claims that global market forces diffuse best management practices and that foreign companies, typically from the OECD, create “pollution halos” in developing countries.

2. This paper examines the evidence in support of both claims. Part I describes what is at stake in the debate, *viz.*, the shape and content of emerging global governance of investment. Part II develops an analytical framework to map potential linkages between FDI and the environment, including micro-level decisions, such as industry location and firm environmental performance, as well as macro-level impacts on eco-systems, indigenous cultures, income and consumption.

3. Part III summarises and evaluates the statistical and case study evidence. Statistical studies focus in the main on two issues: 1) whether and how environmental regulation influences industry location; 2) what determines firm level environmental performance. The studies suggest first, that differences in environmental standards and/or abatement costs have not made a significant difference to firm location decisions; and second, that firms, both domestic and foreign, are incrementally improving their environmental performance in many parts of the world, primarily in response to effective national regulation and/or local community pressure. There is thus little statistical evidence of either a “pollution haven” or a “race to the bottom.”

4. There is also little statistical evidence that foreign firms consistently perform better in developing countries, especially once the firms’ size is taken into account. In some sectors, notably energy, foreign firms are likely to have superior technology, or close links to “green consumer” markets. In the main, however, foreign links, including export markets and ownership of plant, seem to make little difference to firm performance. While foreign direct investment may offer benefits in particular sectors in particular countries, there is no broad “pollution halo” for FDI in general.

5. The case studies paint a more muddy picture. There are cases of egregious local and even national ecological degradation. While foreign firms may not have been drawn in by lower standards, they clearly perform like environmental renegades once they get there. In addition, there is evidence that policy

makers are sensitive to potential effects of higher environmental standards on foreign investors. They may not weaken standards, but they don't enforce them either.

6. On the other hand, there are cases where foreign firms have brought with them higher standards and better management practices, as well as better technology, and cases where foreign firms were the first to respond to consumer pressure for a "greener" product or production process. These improvements, however, have been incremental and have not grappled with larger ecological impacts. The move from more to less toxic banana production in Costa Rica is a good example: while the reduced use of toxic agro-chemicals is to be welcomed, it does not address the widespread damage caused by large-scale mono-cultural production. "Halos" exist, but, to date at least, they are apparently pretty small.

7. Part IV reflects on the evidence as a whole and offers four insights. First, the mix of demonstrated positive, negative and neutral effects of foreign direct investment mitigates against any overarching conclusion about its incremental effects "on average." There *is* no average, performance is context-dependent and other things are far more important than ownership. If the goal is improvement in industry environmental performance, at both micro and macro levels, then what is needed is effective regulation utilising both governments and communities to monitor, reward and sanction firms.

8. Second, a concern to be attractive to foreign investors in a highly competitive global economy has kept a lid on local/national standards or enforcement of standards. While there has not been a universal "race to the bottom," increased globalisation -- lacking a global regulatory framework -- has inhibited a "race to the top" and caused environmental commitments to be "stuck in the mud."

9. Third, while "pollution havens" cannot be proven, a pattern of agglomeration of pollution is discernible, one based not on differences in national environmental standards, but on differences in income and/or education of local communities. They may not be "havens", but there are clearly "pollution zones" of poorer people, both within and across countries, where firms perform worse and where regulation is less effective.

10. Fourth, the quality of the evidence, both statistical and case study, is poor compared to the research needs. Most of the statistical studies rely on very narrow and partial indicators of environmental performance, or use proxies for data that are simply not available. The case studies suffer from data problems as well, including the lack of ecological performance indicators and the lack of analytical frameworks to link macro and micro ecological impacts.

11. Finally, there is a great gulf between what the statistical studies demonstrate and the issues at stake in the debate. Sifting through the evidence thus feels like searching for a small meat ball in a large bowl of spaghetti. In general, the gulf can be characterised as a "micro-macro" problem and reveals the different environmental paradigms at play. Based on a "pollution prevention" paradigm, the statistical and some of the case studies utilise very narrow and partial measures of environmental performance -- often, just one particular pollutant. Environmentalists, however, are concerned not only about pollution but the "environmental management" of eco-systems as a whole, and more broadly about the "sustainable development" of societies.

12. In some of the case studies, foreign direct investment is scrutinised not only as a contributor to local air and water emissions, but also as a macro-phenomenon contributing to the scale of overall ecological impact, as well as national policy making and indigenous and community rights. There is a large gap between even the best of the incremental improvements in company performance and the scale of ecological impact caused by broadly unsustainable production and consumption patterns at the global level. The wealth of northern consumers might help make products marginally "greener," but it also

creates a heavy burden on the earth. It is in this sense that the claim that foreign direct investment is “bad” for the environment has credibility.

13. Part IV concludes with some recommendations about how to enlarge the environmental benefits of FDI. First, it is clear that regulation matters. While local and national regulation can be effective, there is a great need for an overarching global framework to heighten investor environmental responsibilities and get out of being “stuck in the mud.” Located within a set of global rules governing investment, environmental norms should include both micro level investor responsibilities and macro level sustainability objectives. The process of generating and monitoring global rules should provide ample opportunity for input by environmental NGOs and other community pressure groups.

14. Second, a global environmental framework of regulation should target not *foreign* investment, but investment as a whole. Minimum standards should govern any investment project, or at least the larger ones. Such a framework would help to diffuse “best practice” more rapidly, as well as help shift production to greener products.

15. Third, beyond regulation, there is an urgent need for corporate accountability mechanisms. Communities and consumers need access to corporate performance information and corporations need to make such information credible. Fourth, governments need to invest more resources in developing ecological data, including performance indicators.

I. FDI AND THE ENVIRONMENT: THE DEBATE

16. The 1990s witnessed a sea-change in the pattern of international capital flows to developing countries. In 1990, public sources accounted for more than half of the international money flowing to developing countries. By 1995, 77 per cent came from private sources.¹ The biggest story was the explosion in portfolio (equity and debt) investment and, to a lesser extent, commercial bank loans. From a total of about US\$5 billion in 1990, portfolio investment soared to US\$61 billion in 1995 and leaped from 5 to 33 per cent of total private capital flows (World Bank, 1997).

17. The story of foreign direct investment is only marginally less dramatic. While its share of total private capital flows fell a little, the volume of FDI nearly quadrupled. In 1990, FDI flows to developing countries totalled US\$25 billion. By 1995, they had jumped to US\$96 billion. While FDI flows were heavily concentrated -- nearly 40 per cent went to China alone -- the small size of many developing economies meant that the economic impacts were felt throughout the world.²

18. The surge in FDI has been propelled by moves toward trade and investment liberalisation at the global level, as well as the embrace by many developing countries of neo-liberal economic policies -- that is, policies which enhance market competition without regard to social and environmental regulation. According to a recent UNCTAD report, out of 375 substantial changes in laws and regulations governing direct foreign investment between 1991 and 1994, all but five were directed toward liberalisation.³

19. Given the lack of effective national and local government regulation in many developing countries, the growth of FDI has raised concerns about environmental (and social) impacts in both home and host countries. Environmentalists argue that the gap between OECD and developing country standards will draw the worst performing firms and dirtiest industries to the least regulated countries, creating “pollution havens”. Even if not explicitly drawn by low standards, firms -- lacking external oversight -- will perform badly once they get there. Cases of environmental (and social) malfeasance by multinational corporations has been documented. Moreover, argue many environmentalists, the drive to remain or

become competitive in a high globalised economy will drag down standards in OECD countries, creating a global “race to the bottom”.

20. Advocates of neo-liberal governance of globalisation argue that FDI is positively good for the environment. OECD firms typically possess newer and cleaner technology and better management practices. Given the lack of local technological and regulatory capability, FDI is the best way to diffuse best practice production techniques. A number of case studies have demonstrated a “pollution halo” effect, suggesting a slow, but sure, convergence of standards upwards.

21. In a review of the literature, the OECD found that FDI generates both positive and negative effects and identified a significant gap in research on the scale effects of FDI. The most important gap is in research about the potential influence of higher incomes on the demand for environmental quality. Many free-market proponents have made much of a single study showing that demand for environmental quality rises with income once income per capita reaches about US\$5 000 (Grossman and Krueger 1991). The study focused, however, on narrow indicators of environmental performance, *viz.*, three measures of local air pollution. It thus shed no light on other potential environmental impacts associated with affluence, such as the production of toxic and hazardous wastes, the loss of biodiversity/habitat and atmospheric pollution.

22. Despite its recognition of the need for further research, the OECD suggests, at least in terms of the primary claims being made, that the impacts of FDI overall tend to be positive. “Fears of a ‘race to the bottom’ in environmental standards, based on the idea of ‘pollution havens,’ may be generally unfounded,” the report concludes. Though this conclusion may not hold in specific cases, “FDI is an increasingly important ‘engine’ for sustainable development in many countries” (OECD 1997, p. 13).

23. At stake in what is a very heated debate is the shape and content of emerging rules governing the world economy generally and international investment in particular. The debate erupted in the context of the North American Free Trade Agreement (NAFTA), giving rise to a set of environmental “side agreements” and the creation of the North American Commission on Environmental Co-operation. The main implication for FDI was that a NAFTA nation could not lower or not enforce its own national environmental standards in order to gain competitiveness -- that is, it could not seek to become a “pollution haven.”

24. The debate went global in the context of OECD negotiations over the Multilateral Investment Agreement (MAI). Environmental (and labour/human rights) activists throughout the world decried the draft agreement because of what they considered its one-sided approach, specifying the rights but not the obligations of foreign investors. Moreover, except for a draft clause prohibiting the use of lower environmental standards as an investment incentive, it called on states to facilitate and protect only investment and not other social and environmental aspects of the public good. Environmental obligations of investors made an appearance only in the OECD’s Guidelines for Multinational Enterprises, which would have been associated with the MAI in a manner to be specified.

25. Rules governing investment are also being discussed within the World Trade Organisation, including within the Trade Related Aspects of Intellectual Property Rights (TRIPS). As with its trade negotiations, the WTO’s approach to governing investment is based on neo-liberalism, *viz.*, dismantling national economic protectionism and creating global markets --while leaving the social regulation of markets to states.

26. The capacity of states to effectively govern global markets, however, is highly constrained (Zarsky, 1997). If, as the most ardent free marketeers argue, markets themselves deliver social objectives

like better environmental protection, then there is little need for global environmental regulation. If they do not, as environmentalists argue, then regulation at global and regional levels is needed. Indeed, given both market failure and the governance failure of global economic institutions, a strong voice within the environmental community advocates a retreat from globalisation itself.

27. To date, there has been little political will by governments for global and/or regional social regulation of investment. Rather, there has been an emphasis on corporate “self-regulation” through voluntary systems such as ISO 14000 and codes of conduct. Support for more formal regulation, however, may be growing. The financial and economic crises in Asia have raised a hue and cry about the need for regulation of global financial markets. The principle and, in some cases, implementation of common environmental objectives and standards has been embraced by the European Union. In addition to the question of *whether* there should be global regulation, what is at stake in this debate is *what kind of* approach to regulation might be most effective.

28. This paper examines some of the key evidence in support of claims as to the benevolent or malevolent impacts of FDI within a neo-liberal global governance regime (*i.e.* without global common norms). Part II develops an analytical framework to map broadly the potential linkages between FDI and the environment. Part III summarises and evaluates some of the key statistical and case study evidence. Part IV offers four insights about the evidence which suggest some new directions for both research and policy. Part IV concludes that, to capture the positive benefits of FDI, rules governing investment must explicitly define broad environmental objectives and responsibilities.

II. FDI-ENVIRONMENT LINKAGES: A CONCEPTUAL FRAMEWORK

29. The complex and multiple interrelationships between FDI and “the environment” writ large have not been conceptually charted. Analysts and activists have approached the topic from a wide variety of angles, ranging from the pollution propensities of particular foreign firms or sectors to the impacts of environmental standards on competitiveness. Many studies have jumped from very narrowly construed questions to very broad policy conclusions -- or *vice versa*.

30. The OECD characterised FDI-environment linkages in three ways: 1) the environmental effects of FDI-based technology development and diffusion; 2) the impact of environmental standards on investment decisions by firms; and 3) the environmental effects of international competition for FDI (OECD, 1997). While useful, this framework leaves out some of the issues of greatest concern to environmental scientists and advocates, especially the impacts of (neo-liberal) FDI on the scale of ecological impact both locally and globally.

31. A more expansive framework would include the following:

1) *Micro linkages:*

- Impact of environmental standards on firm/industry location/investment decisions;
- Impacts of foreign firm technology, management and size on firm-level environmental performance;

2) *Policy linkages:*

- Impacts of international competition for FDI on environmental regulation/norms;

3) *Macro linkages:*

- Direct impacts of (neo-liberal) FDI on the scale of ecological degradation and use of environmental space;
- Impacts on ecosystems and environmental policy of FDI-related increases in income and consumption;
- Impacts of (neo-liberal) FDI on local revenues, including via taxes and royalties, and on the provision of public goods;
- Influence of foreign firms on the local political economy, including environmental policy;
- Socio-environmental impacts of foreign direct investment, including on worker/community health and safety and indigenous cultures;
- Environmental security impacts of FDI-related cross-border pollution/degradation on international conflict and co-operation.

A. *Micro Linkages*

32. Micro-level linkages between FDI and environment focus on two main issues: 1) industry location; and 2) firm-level environmental performance. In broad terms, the three possibilities are that FDI enhances, degrades or is neutral to environmental objectives in developing countries.

1. Pollution Havens

33. The “pollution haven” hypothesis posits that differential environmental regulations influence firm (or industry) level location decisions. There are two variants of the hypothesis. The “industrial flight” variant suggests that pollution-intensive “dirty” industries will flee the relatively higher costs of environmental compliance in OECD countries and relocate where compliance costs are lower. Typically, compliance costs are conceived of in terms of pollution abatement costs which are lower because standards are lower. However, costs could also be lower because transactions costs of compliance are lower, even if standards are the same (Anderson *et al.*, 1997). What is key is that OECD firms are pushed out by high costs of complying with environmental regulations. The firms themselves may not physically relocate, but new investment will be skewed towards low-standard locales.

34. The other variant puts more emphasis on the “pull” factor, that is, on the direct use by developing countries of low or lax environmental standards to attract foreign firms. The “dirty” industries, which have the highest abatement costs, will be most attracted. Within non-dirty industries, firms with poor environmental performance might also be attracted. Some analysts argue that lower standards are not the result of deliberate beggar-thy-neighbor policies, but reveal true social preference. A greater tolerance for pollution, they suggest, is a legitimate source of competitive advantage (Jensen, 1996).

35. Whether “pushed” or “pulled,” dirty industries and poorly performing firms will, according to the pollution haven hypothesis, agglomerate in low-standard developing countries. Leaving aside potential impacts on standards in the OECD (and on local income), would such an agglomeration be “good” or “bad” for the environment in some overall, global calculus? It is possible, for example, that greater social tolerance for pollution might stem from a relatively higher absorptive capacity on the part of local eco-

systems in developing countries. If so, then locating dirty industries in developing countries might be “good” for the environment.

36. On the other hand, given that there are few political mechanisms by which to reveal social preference, it is far more likely that low standards reveal little about absorptive capacities and much about weak management capacities -- and about elite preferences for rapid industrialisation. Indeed, absorptive capacities might well be lower in many highly-populated developing countries. From this perspective, it would be better for the environment if dirty industries were agglomerated in locales where management capacities and community oversight mechanisms are strongest.

37. The pollution haven hypothesis also raises ethical questions. Even if a skewed pattern of polluting industries reveals “true social preferences,” such preferences would stem primarily from poverty in developing countries and inequity at a global level. Is it just that poor people must choose between fulfilling fundamental economic requirements and their own -- and their children’s -- health and access to nature? From an environmental justice point of view, heaping pollution on poor people is akin to discrimination before the law.

2. *Pollution Halos*

38. The “pollution halo” concept focuses not on industry location, but on the environmental performance of foreign relative to domestic firms. It suggests that what is important is not why a firm locates where it does, but how it performs once it gets there. OECD firms typically have newer, cleaner technology and better environmental management systems, often as a result of the higher regulatory requirements in the OECD. Moreover, OECD-based firms often have important export markets back home and are sensitive to the demands of “green” consumers. Assuming that multinational corporations have the same internal company standards and procedures regardless of the country in which they operate, FDI is a vehicle by which to diffuse “best practice” throughout the world.

39. Besides advantages of technology and management, foreign companies are usually large relative to domestic firms in developing countries. Being big means that a company has deeper pockets for investment in research and development, as well as environmental management systems. As domestic firms learn from and copy the foreign firms, developing country environmental performance will converge towards OECD levels.

40. It is important to clarify that the “halo” effect requires some discrimination between foreign investors. Obviously, there will be no “halo” effect if the foreign company itself is an environmental polluter. Newly industrialising countries like Chinese Taipei and Brazil are themselves becoming important sources of FDI. Given the still rudimentary nature of environmental regulation at home, there is more reason to expect that they will diffuse “worst” rather than “best” practice.

41. Moreover, it is possible that OECD firms do not in fact maintain the same standards wherever they operate, but respond in a myriad of ways to incentives to lower standards in developing countries. This might include less care in environmental impact assessment, less training and/or protective equipment for employees, less investment in monitoring and mitigating pollution, *etc.* Even if internal company standards are the same, the difference in external context, especially the lack of adequate waste management infrastructure and disaster response capacities, may enhance the environmental and health risks of FDI in developing relative to OECD countries.⁴

42. Finally, it is possible conceptually that neo-liberal FDI brings neither much of a halo nor an agglomeration of dirty industries in low standard countries. Rather, the effects of environmental regulation might be small or irrelevant compared to other determinants of industry location, such as transport costs and wage rates; and other determinants of environmental performance, including government regulation, income, and community pressure, might matter much more than foreign ownership or links to OECD markets.

B. Policy Linkages

43. The micro linkages outlined above focus on the impacts of environmental norms on firm decisions. Another set of FDI-environment linkages focuses on the impact of economic integration on environmental standards and norms. Like other forms of regulation, environmental standards are subject to convergence pressures in a global economy. The immediate issue is that, in the context of neo-liberal globalisation, *i.e.* where market access is protected, but there are no common environmental norms governing investment, concerns to retain or gain competitiveness could conceivably drive OECD standards down. A process of downward harmonisation would result in a “race to the bottom”.

44. Another variant on the theme of convergence is the “stuck in the mud” hypothesis (Zarsky, 1997). Downward pressures on standards in the OECD may be kept in check by popular demands for environmental health. In addition, firms may develop “win-win” production techniques which enhance both environmental protection and competitiveness; and they may diffuse good environmental practice via the pollution halo effect described above, causing an upward convergence in standards. For these reasons, standards may not drop, at least not precipitously.

45. However, by creating a “prisoner’s dilemma,” neo-liberal global economic integration constrains the rate of improvement in environmental standards. States are reluctant to take big unilateral leaps towards better environmental management because they could be priced out of international markets and investment. Rather, they will make only incremental improvements in environmental norms that are broadly in line with primary trade and investment partners. The setting of environmental standards, at least those which directly impact on international trade and investment, is thus a collective action problem. Without collective action, environmental standards may not race to the bottom, but they will certainly not “race to the top.” Instead, they will be “stuck in the mud”.

C. Macro Linkages

46. Much of the statistical and business literature on FDI-environment linkages focuses on micro issues, especially firm-level location decisions and management practices. Indeed, many studies take a very micro-ecological approach to micro-economic issues and explore “environmental impact” in terms of only one pollutant (see below). The environmental literature, however, tends to focus on broad policy impacts, as well as on the broad macro-ecological-economic impacts of FDI. There are at least six potential pathways by which FDI can influence macro environmental variables.

47. The first -- and the one of greatest concern to environmentalists -- is the scale impact of FDI. Foreign firms are typically larger than domestic firms; in some cases, only foreign firms have the requisite production capabilities to invest in a particular sector. Even if foreign firms are relatively less polluting across all emissions and/or more concerned about sustainable resource harvesting, the overall quantity of pollution and level of resource degradation increases with a greater level of investment. In addition to pollution, a large increase in the scale of investment without a larger “sustainable

development” land and resource use planning framework is likely to undermine biodiversity and degrade common access resources such as rivers and coastlines. Most environmental impact assessments consider only the micro-impacts of particular investment projects and not the macro-impacts of the project or of the sum total of like projects.

48. The environmentalists’ concern about scale is not limited to foreign direct investment, but to rapid and unsustainable growth in general, whether financed by domestic or foreign investors and whether in the OECD or in developing countries. In some countries, however, foreign firms are the primary source of rapid growth. Indeed, in all countries, the contribution to GDP growth is typically cited by economists as an important rationale for openness to FDI. While they may bring or undertake incremental improvements in local environmental performance, foreign firms enhance and sometimes even are the primary transmission belt for the broadly unsustainable production and consumption patterns of OECD countries.

49. Impacts on income is the second broad macro FDI-environment linkage. On the positive side, increases in income may provide moneys for an increased commitment to environmental protection and restoration by governments, businesses, communities and consumers. On the negative side, in the absence of effective environmental norms and macro planning frameworks, increases in income will exacerbate the ecological scale impacts described above. A reduction in local pollution, for example, may be counterbalanced by a larger contribution to greenhouse gases or acid rain. The reduction in the use of agro-chemicals may be counterbalanced by the expansion of unsustainable monoculture cropping patterns.

50. A third macro linkage is the impact of FDI on the local tax base. Through the use of transfer pricing and other mechanisms, foreign firms are often able to avoid local taxes, reducing moneys for public goods. Environmental public goods include waste and water management infrastructure, habitat conservation, and environmental education.

51. A fourth macro linkage can be categorised broadly as political economy impacts. Foreign firms often wield significant political influence in developing countries (and at home). In terms of environmental impacts, such influence could be used to promote or inhibit environmental planning and regulation by local governments, as well as to promote or inhibit community involvement in environmental monitoring and policy formation.

52. Fifth, FDI has socio-environmental impacts on workers, local communities, and indigenous cultures. For workers and local communities, health and safety impacts are often the most pressing, though issues of access to resources such as water are also often important. Foreign firms may -- or may not -- implement higher occupational health and safety standards than domestic firms, or may be pressed by governments and NGOs at home to raise their standards. Indeed, a broad range of human rights, including the right to community participation in environmental monitoring and policy making, are part and parcel of FDI-environment linkages. Given the fact that the culture of most indigenous groups is closely bound up with nature, the protection or violation of indigenous rights and cultures forms one of the most direct aspects of the linkages between human rights and environment. Foreign firms have often been the vehicle by which resource exploitation has intruded upon indigenous societies.

53. Sixth, FDI may generate cross-border pollution and/or resource degradation, generating international friction and/or potentially stimulating international co-operation in environmental management. These “environmental security” linkages are not restricted to the activity of foreign firms. However, with foreign firms, the issue of which government has jurisdiction over what is often cloudy, necessitating international diplomacy to develop regimes to manage common resources.

III. FDI AND THE ENVIRONMENT: THE EVIDENCE

54. At a conceptual level, the potential impacts of FDI on the environment encompass a wide range of tangled and contradictory direct and indirect effects. Empirical work is important in answering the overarching question at stake in the debate, *viz.*, what kinds of rules/norms should govern FDI and, more broadly, investment in order to maximise the positive impacts? This section reviews and evaluates some of the most recent and most seminal empirical evidence.⁵

55. Most research efforts have focused broadly on one of two objectives, *viz.*, to determine quantitatively whether a particular hypothesised FDI-environment relationship is significant in the aggregate; and/or to identify the range of potential impacts by examining particular investment projects, industry sectors, or countries. The primary kinds of empirical evidence are thus statistical and case studies.

56. Statistical studies search for patterns at a high level of aggregation and test narrowly defined hypotheses. The statistical studies reviewed here focus on two micro-linkage issues: 1) whether and how environmental regulation influences industry location; and 2) what determines firm level environmental performance. The strength of the statistical approach is that it can shed light on general trends, thus affirming or rejecting the broadest hypotheses and steering policy innovation towards the broadest concerns rather than more isolated cases.

57. The weakness is two-fold. First, it requires that questions be narrowly specified, skewing statistical studies—and thus policy—towards micro rather than macro linkages. Within the micro category, statistical studies typically test extremely narrow questions; *e.g.* considering only one pollutant to represent the entire universe of “environmental impacts.” Second, even if questions are properly specified, the ecological data are simply not available. Researchers must thus either exclude key variables or utilise various kinds of proxy variables which, in the view of ecologists, miss the mark. The marriage of statistics with ecological science is often not very fertile.

58. There are also strengths and weaknesses in the case study approach. The greatest weakness stems from the fact that single case studies may or may not reflect trend. Environmental advocates often focus, of necessity, on the worst cases of environmental abuse by foreign companies. Whether such cases are outliers or reflect a pattern is not immediately clear. The strength of the case study approach is that it allows for the inclusion of a much wider and nuanced information set: both micro and macro questions can be explored and a wider variety of both qualitative and quantitative evidence brought to bear. Moreover, with enough case studies, broad patterns and trends can be discerned and local/regional specific issues can be separated from global trends.

A. *Statistical Studies: Pollution Havens and Halos*

59. The statistical evidence reviewed here focuses on first, whether environmental regulation influences firm location decisions, that is, the industrial flight/pollution haven hypothesis (Anderson *et al.*, 1997; Eskeland and Harrison, 1997; Xing and Kolstad, 1997); and second, whether the fact of foreign ownership or financing affects environmental performance in developing or transitional economies (Aden *et al.*, 1998; Blackman and Wu, 1998; Dasgupta *et al.*, 1998; Eskeland and Harrison, 1997; Hettige *et al.*, 1996). A number of studies also explore determinants of environmental performance without differentiating between foreign and domestic firms (Afsah *et al.*, 1996; Dasgupta *et al.*, 1997; Pargal and Wheeler, 1996). Together, the two sets of performance-oriented studies shed light

on whether environmental standards are rising in developing countries despite the lack of effective formal regulation.

60. The aim of this review is less to be comprehensive—other studies have already accomplished that (Adams, 1997; Jaffe *et al.*, 1995; OECD, 1997)—than to bring to light more recent studies and to explore some fresh insights.

1. *Industrial Flight/Pollution Haven*

61. The pollution haven hypothesis has been around long enough to generate a significant body of statistical evidence, the lion's share of which has found no significant relationship between environmental standards and industry location decisions (Jaffe *et al.*, 1995). The studies typically use sector or industry level investment data to see if the proportion of foreign investment is greater for "dirty", *i.e.* the industries with the highest levels of emissions, than for other industries (Eskeland and Harrison, 1997). Most studies have found that it is not and have concluded that there is no evidence to support the "pollution haven" hypothesis.

62. The explanation usually put forward is that abatement costs are too small a fraction of total production costs to matter to location decisions. Given that the hypothesis rests on differential costs of complying with environmental regulation, the inability of macro level data to reveal a pattern of industrial flight suggests either that abatement costs are not very high in developed countries, that the abatement cost differential between developed and developing countries is not very great, or both.

63. A study of pollution abatement capital expenditures (PACE) for US industries in the early 1990s found that, for most industries, PACE was less than 5 per cent of total capital expenditures (Jaffe *et al.*, 1995, p. 141). Even for most of the dirtiest industries—paper, chemicals, and primary metals—PACE was less than 14 per cent. Only for the petroleum and coal sector was PACE significant: about 25 per cent of total capital expenditure (but still less than 2 per cent of the annual value of shipments).

64. Only one study found a "strong confirmation" of the theoretical prediction of the pollution haven hypothesis (Xing and Kolstad, 1997). The study asks the question, "Do lax environmental regulations attract foreign investment?" Because it is not possible to directly observe laxity, the researchers utilised an observable variable, aggregate national sulphur emissions, as a proxy. They found that pollution-intensive industries from the US were strongly attracted to countries where environmental regulation was lax (*i.e.* where national sulphur emissions were high). There was no effect on less polluting industries.

65. While interesting, the Xing and Kolstad study reveals the weakness of the statistical approach. The use of aggregate national sulphur emissions as a proxy muddies cause and effect: higher emissions are as likely to be the effect as the cause of FDI. Indeed, the authors themselves conclude that they had not provided "convincing evidence that the environmental variable dominates other determinants in the process of determining FDI of a polluting industry" (p. 21). On the other hand, the other statistical studies showing no correlation at all also tend to specify variables narrowly—and draw conclusions broadly. One is left with the nagging suspicion that they have not asked the right questions.

66. A recent World Bank study, for example, confidently and unambiguously rejects the pollution haven hypothesis and the ethical questions it raises (Eskeland and Harrison, 1997). "Political and ethical questions about environmental quality can hardly be of great importance if the migration south of polluting industries is not of significant quantitative importance" (p. 4).

67. The study examines FDI in four developing countries and found no significant positive correlation between measures of air and water emissions and FDI. However, the results require excluding data that make the association positive for air pollution—the case of French investment in the cement industry in Morocco. The authors justify the exclusion because the cement is not exported back to France, suggesting that laxer environmental standards were therefore not the likely incentive to invest in Morocco. While the study has a neat conclusion, one is left wondering what is really happening in Morocco, how many other Moroccos are out there, and whether such studies obscure more than they illuminate.

68. An interesting twist on the pollution haven hypothesis is explored by Anderson *et al.* (1997). They suggest that the statistical studies to date may have misspecified the determining variable. Rather than abatement costs, the key variable for business is the total cost of complying with environmental regulation, including both abatement and transactions costs. They argue that the costs of environmental compliance are higher in the US than other OECD countries because of “adversarial legalism”. They set out to prove, not altogether successfully, that the higher transactions cost of doing business in the US stimulated investment in Europe by US mining companies in the 1980s and 1990s.

69. One interpretation of the lack of statistical support for the industrial migration hypothesis is that, despite the gap in standards between developed and developing countries, environmental regulation is universally “too low” (Zarsky, 1997). Even if the gap between OECD and developing countries is large, the total environmental spending by OECD firms, apparently, is too small to matter. Given the continuing problems of industrial pollution in the OECD, this must mean that industry as a whole is not internalising environmental costs. Rather than agglomerating in havens, a more likely global pollution pattern as countries industrialise -- barring collective action to significantly raise norms -- is for pollution to become globalised.

2. *Environmental Performance – Pollution Halo ?*

70. One of the key questions about FDI and environment is whether foreign direct investment brings significant improvements in environmental performance in developing countries. The “pollution halo” hypothesis suggests that superior technology and management, as well as demands by “green consumers” at home, make OECD firms the vehicles for better performance. Learning and copying effects by domestic firms might also lift industry standards overall.

71. The primary statistical work on this issue has been undertaken by the “New Ideas in Pollution Regulation” group at the World Bank. The group has focused on the question, “What determines firm-level environmental performance ?” The question is especially salient in developing countries, which lack effective and enforced regulatory structures. However, the fundamental insight that side-by-side firms perform differently even when regulation is in place has generated interesting insights in developed countries as well (Dion *et al.*, 1997; Laplante and Rilstone, 1995).

72. Evidence in support of the pollution halo hypothesis is provided by Eskeland and Harrison (1997). Using energy use per unit of output as a proxy for energy emissions, they found that foreign ownership was associated with cleaner and lower levels of energy use in the three countries of their sample (Mexico, Venezuela, Cote d’Ivoire). A study by Blackman and Wu (1998) also found significant support for the conclusion that foreign investment in electricity generation in China increased energy efficiency and reduced emissions. The primary reason is that FDI is focused on advanced generating technologies. Better management and the introduction of competition are also part of the halo effect.

73. A number of other studies, however, have found no significant effect of foreign ownership or financing. In a study of Mexican manufacturing firms, Dasgupta *et al.* (1998) found that “OECD influence” did not affect the degree of “environmental effort” by firms. The degree of effort was measured by two variables: the adoption of ISO 14 000 type procedures and the use of plant personnel for environmental inspection and control. Using survey methodology, the researchers found that new technology was not significantly cleaner and there was no evidence that plants with new equipment had better environmental performance.

74. What did matter to environmental performance in Mexico was the size of the plant and multi-plant status (larger size and multi-plant firms were positively correlated with more effort), recent experience of regulatory pressure (inspections), and public scrutiny. For company compliance with its own internal environmental guidelines, the most important variable is strong regulation. The foreign connection in general was not significant. “We do not find,” they conclude, “a significant role for any OECD linkage: multinational ownership, trade, management training, or management experience” (p. 18).

75. Three other studies in Asia, summarised in Hettige *et al.* (1996), also found foreign ownership, financing, or links to OECD markets to be insignificant in firm-level environmental performance. Huq and Wheeler (1993) examined fertiliser and pulping plants in Bangladesh; Hartman *et al.* (1995) examined determinants of pollution abatement among 26 pulp and paper plants in Bangladesh, India, Indonesia and Thailand; and Pargal and Wheeler (1996) conducted an econometric analysis of determinants of performance among plants across a number of sectors in Indonesia.

76. Like the Mexican study, these studies in Asia found that the scale of the plant or firm was positively associated with environmental performance -- *i.e.* the bigger the better. They also found that “rapidly spreading multinational facilities are relatively clean” because they employ newer technology (p. 1901). The most important factor, however, was not ownership (*i.e.* domestic vs. foreign), but the newness of the facilities: new plants, whether domestic or foreign owned, are likely to be cleaner because of newer technology. In a surprising twist, a recent study of manufacturing plants in Korea by Aden *et al.* (1998) found that domestic firms apparently perform better than foreign firms. The variable examined was plant level spending on pollution abatement. The authors speculate that the reason that domestic firms spend more might stem from the attempt by the unpopular Korean chaebol to shield themselves from public criticism.

77. All these studies suggest that, despite the lack of effective regulation, environmental performance of many firms is improving. Rather than pollution-intensive production across the board, Hettige *et al.* (1996) conclude that “Despite weak or non-existent formal regulation and enforcement, there are many clean plants in the developing countries of South and Southeast Asia” (p. 1891). What accounts for this? While scale and technology effects are important, what emerges from these studies (as well as the Mexican study) as the most significant determinant of firm performance is community pressure.

78. The actual mechanisms by which communities pressure firms to clean up are not clearly spelled out in these studies (with the exception of Korea, where communities have signed formal agreements with companies). Instead, what the studies show is a high correlation between the income and/or education level of a particular community and the overall level of environmental performance by firms located in that community. This result is strong in Indonesia and Thailand, in China (Afseh *et al.*, 1996), and in South Asia. Apparently, richer and more educated communities are able to bargain effectively with firms. Poorer and less educated communities are not.

79. In addition to community pressure, the Mexican and Korean studies suggest that strong regulation matters. Firms adjust their effort and their performance based on expectations of enforcement, especially site inspection visits and sanctions. In Korea, regulators apply an increasingly intrusive monitoring program and escalating sanctions depending on past performance.

3. *Case Studies: Performance, Standards -- and More*

80. Detailed case studies of FDI and environment linkages are relatively scarce. The most recent in-depth studies are found in Gentry (1998) and Earth Council (1998). Gentry presents studies of FDI in the agricultural sector in Costa Rica (bananas) and Brazil (soybeans and pulp and paper); and in the manufacturing sector in Costa Rica and Mexico. The Earth Council studies examine a number of environmental and human rights conflicts involving FDI, including in the “growth triangle” in Indonesia (Sari, 1998); offshore oil drilling in the Russian Far East (Rosenthal and Mischenko, 1998); and gold mining in Suriname (MacKay, 1998).

81. The five case studies edited by Gentry focus on examining whether and why foreign firms are making incremental improvements in environmental performance. The three agricultural case studies examine monocrops with a high proportion of exports and foreign investment, as well as environmental impact. Negative impacts include soil erosion, water pollution, chemical use, loss of habitat and biodiversity, and waste. Basing himself primarily on the Costa Rican experience with bananas, Gentry concludes that the FDI-environment linkage is generally positive: “Led by multinational companies, improvements in environmental performance are being made as a result of pressure from export customers, efforts to reduce production costs and some government programs” (p. 61). The role of government, however, is not as in traditional forms of regulation, but in the integration of environmental considerations into programs which aim to attract investment and trade.

82. Pressure from export customers has been crucial in the Costa Rican banana case. Two NGOs, the Rainforest Alliance and AMBIO foundation, have joined forces in creating an “Eco-OK” certification program. To be certified, companies must be inspected and evaluated on five criteria: 1) handling of hazardous substances; 2) waste management; 3) occupational health; 4) drinking and waste water quality; and 5) reforestation programs (Gentry, 1998, p. 63). There is evidence that some Costa Rican producers, especially the larger, multinational companies, are reducing the chemical intensity of banana production. Since it is difficult to identify positive environmental impacts, the study bases its conclusions on the fact that banana producers in Costa Rica use less fertiliser and irrigation than other crops, and have higher productivity than other producers in other countries.

83. Despite Gentry’s unequivocal assessment, the other two agricultural case studies are in fact ambiguous in detailing incremental positive links between FDI and the environment. In the case of the Brazil pulp and paper industry, some improvements may have been made, including the fact that the government now requires rigorous Environmental Impact Assessment of new projects. However, monitoring is still poor. In terms of self-regulation, the industry is working with the national standards agency and the Forest Stewardship Council to develop a national certification system. However, only one firm to date has taken a proactive stance and achieved ISO 14 000 certification.

84. In the case of the soybean industry in Brazil, foreign firms are not very active in production, but are very involved in processing and marketing and could potentially be influenced by export customers. To date, however, they have not felt much influence. The Brazilian government is planning a huge expansion of 50 million additional hectares of soybean production. According to the case study author, the

“environmental impacts [of the expansion]...particularly in the Amazon region, have not yet been sufficiently evaluated” (p. 80).

85. The key issue in these three case studies, however, is not whether multinationals are incrementally improving performance. Even granting that Gentry’s optimistic assessment on this score is warranted, the heart of the matter is that the monocultural cropping patterns as a whole are unsustainable. At an eco-system level, the scale of banana production -- including the scale of agro-chemical use -- suggests that no amount of Eco-OK bananas will set Costa Rica or the world as a whole on the path to sustainable agriculture. “Chiquita has made some improvements in recent years,” acknowledges Catherina Wesseling of the Pesticide Program of the National University of Costa Rica,” but the intensive cultivation of bananas, has never been -- and probably never will be -- done on a sustainable basis” (quoted in Wheat, 1996, p. 14). Many environmentalists, like biologist Gabriel Rivas Ducca of the Costa Rican Ecological Association in San Jose, argue that green seals should be reserved for bananas produced on a small-scale sustainable basis (Wheat 1996).

86. The two manufacturing sector studies in Gentry (1998), which focus on Costa Rica and Mexico, shed light on the role of government regulation and the “race to the bottom” hypothesis. In Costa Rica, the government has actively pursued foreign investment via the Free Zone Law. In 1995, 183 companies operated under the free zone system, up from 11 in 1986. The case study suggests that, in the pursuit of particular investment projects, the government “skipped...legal requirements, including environmental norms and rules” (p. 130).

87. Indeed, the Free Zones Law does not include clear environmental requirements for companies coming to Costa Rica, there is no enforcement of the laws governing companies in the free zones, the legal framework is confusing and incomplete, and people working for governmental investment-attraction agencies do not know about environmental laws and norms (pp. 131-132). Of the 183 companies in the free zones, only two -- both subsidiaries of US companies -- have formal environmental programs.

88. Hence, the central insight from the Costa Rican case study is that the government is highly sensitive to competition for foreign investment; and that this sensitivity is putting a drag on the enforcement of environmental regulation. The case study lends support to the “stuck in the mud” hypothesis about the relationship between FDI and environmental standards.

89. The Mexican case study, by contrast, paints a picture of increasing environmental regulation and enforcement -- without the flight of foreign investors. Based on a survey of environmental managers in manufacturing firms, mostly large, US-based firms, the study found that companies are making significant environmental investments, especially in water treatment. The investments, financed primarily by local operations, were motivated by government regulations and inspections, followed by corporate policy, cost savings, and ethical standards.

90. The Mexican case study concludes that foreign companies were at least as responsible towards the environment and as sensitive to local regulation as Mexican companies. It also concludes that “the lessons of Mexico suggest that Third World countries can increase the strictness of their environmental regulation and enforcement without fear that foreign direct investment will flee” (p. 116).

91. The three Earth Council studies take a more anthropological approach in mapping the linkages between FDI and the environment.⁶ The primary focus of the case studies is the interface between foreign companies and local communities. In each study, a foreign investment project is the object of considerable community opposition or concern on environmental grounds, both micro and macro. Human/indigenous rights featured prominently.

92. In each case, the studies found that the internal procedures of foreign companies to assess, monitor and/or mitigate environmental degradation ahead were inadequate or non-existent. In two of the cases, Indonesia and Suriname, the companies responded to local community pressure and moved towards improving environmental performance in the face of local criticism. In the Sakhalin case, the companies undertook an environmental impact assessment of large-scale offshore oil drilling only when they were pressed externally, primarily by multilateral finance agencies. In fact, the oil companies have actively undermined local environmental laws and are now the target of a lawsuit testing the environmental provisions of Russia's new constitution.

93. In the other two cases, response to community pressure was inadequate in the eyes of some of the key protagonists in the conflict. In the Suriname case, the proposed project, which involves two Canadian gold mining companies, requires the relocation of an indigenous maroon community. A significant part of the community, however, does not want to move. After confrontations and a number of attempts at mediation, the companies offered to pay some compensation. The dispute, however, was over rights to land. Neither the companies nor the Suriname government, which does not recognise tribal land rights, were willing to redesign the project or to consider the validity of the right of indigenous people to say no to the mining project. International pressure, spearheaded by the Forest Peoples Programme of the World Rainforest Project, has been important in bringing pressure on both the government and the companies.

94. The Indonesian case study involves the Batam Island export oriented trade and investment zone in the "growth triangle" of Indonesia, Singapore and Malaysia. Sari found that local community pressure was effective in forcing the clean-up of toxic and hazardous wastes in the Batu Ampar industrial zone. However, there were no effective institutional mechanisms by which communities could raise concerns about the development process in the Island as a whole, which threatens to severely undermine both biological diversity and human health.

95. Besides community pressure as a determinant of environmental performance, the Sakhalin case, which involves consortiums of US, Japanese, and European companies, examines two other kinds of FDI-environment linkage. The first is political economy. The study suggests that the oil companies are active in influencing the development and enforcement of environmental law in Russia. The second is contribution to the local economy: the Production Sharing Agreements between the oil companies and the Russian government have the lowest royalty rate of any PSA in the world.

96. The Earth Council case studies confirm what the Gentry studies found, *viz.*, community and external pressure can press multinationals to improve their environmental performance, but only incrementally. The large macro issues -- the ecological scale impacts of FDI, the political economy effects of foreign investors, and the socio-environmental impacts of investment projects in countries with weak or non-existent legal protections -- remain outside the grasp of individual community or NGO campaigns.

97. In addition to the detailed case studies, a number of foreign investment projects have also been targeted by NGOs and others for intensive study and criticism. A sample of some of the most high-profile cases include:

- oil exploration and drilling in the Amazon (Kane, 1995) and in Nigeria (Sierra Club, 1998);
- natural gas pipelines in Burma (International Rivers Network, 1999) and in Thailand (Knight, 1998);

- the Grasberg Gold Mine operated by Freeport MacMoran Copper and Gold Company in Indonesia (Project Underground, 1998);
- manufacturing sector FDI in the *maquiladoras* along the US-Mexican border and more broadly, within the NAFTA context (Public Citizen, 1999);
- FDI in the exploitation of forest timber resources, especially in Southeast Asia and the South Pacific, and the role of eco-labelling of forest products (Dixit, 1995; Nigel and Sullivan, 1995);
- FDI in the expansion of the banana industry in Costa Rica and the role of eco-labelling (Wheat, 1996).

98. A number of themes run through the NGO literature. First, foreign companies are often the sole or primary source of particular kinds of investment in particular countries. In Burma and Nigeria, for example, foreign oil companies are the sole source of investment in the exploration and drilling of oil and natural gas. In the Amazon, foreign companies are the primary source of oil investment. In the South Pacific, foreign companies are the sole investors in rain forest exploitation. In Indonesia, only a foreign company or consortium could take on the scale of the Grasberg Mine.

99. The key issue, therefore, is not how foreign companies compare with domestic companies, but rather, how they perform in absolute terms in particular contexts. While some of the statistical studies have found benefits to scale of FDI, some of the case studies suggest that environmental impacts of scale can be highly negative.

100. Second, the index by which NGOs evaluate multinationals involves not a single or narrow set of environmental indicators, but a broad range of both micro and macro criteria. These include local emissions/pollution, human/indigenous rights, contribution to the local economy, and political-economic relationship to the government. Typically, the cases which develop into international campaigns are those where the behaviour of the foreign firm is found wanting on all counts.

101. The California-based Unocal oil company, for example, the target of the Free Burma campaign, is criticised not only because its proposed gas pipeline will destroy pristine rain forest, but because it is actively supporting a repressive military regime. Unocal's performance is egregiously bad: three other oil companies, Arco, Amoco, and Petro-Canada, as well as several apparel companies, have already withdrawn their operations from Burma. While the statistical studies spotlight narrow indicators of performance, the case studies tug analysis towards a wider set of FDI linkages and impacts.

102. Third, the NGO literature suggests an ambiguous relationship between environmental standards and FDI and more broadly, globalisation. In some cases, a relationship to foreign export markets has brought "green consumer" pressures on foreign and domestic companies alike. Via eco-labelling, OECD consumers can discriminate between products produced under more versus less environmentally benign processes. The "eco-banana" and the certification by the Forest Stewardship Council of sustainably produced rain forest timbers are the clearest examples. Eco-labelling may thus push standards up.

103. In the NAFTA context, on the other hand, economic integration might be causing standards to be "stuck in the mud" or even to slide down. Out of seven challenges using NAFTA's provisions giving private investors the right to sue governments, six involve attacks by US corporations on federal or state-level environmental measures in Canada and Mexico. The best known is the successful claim of the Ethyl Corporation against Canada. As a result of a Canadian Internal Trade Agreement panel ruling that went

against the federal government with respect to limits to interprovincial trade in an Ethyl Corporation product (MMT), the Canadian government rescinded such limits and paid US\$13 million to Ethyl Corporation in return for Ethyl terminating its legal actions under NAFTA.

C. *Reflections On the Evidence*

104. As a whole, the statistical and case study evidence suggests a number of conclusions can be made about FDI-environment linkages. First, differences in environmental standards and/or abatement costs have apparently not made a significant difference to firm location decisions. Second, firms, both domestic and foreign, are incrementally improving their environmental performance in many parts of the world, primarily in response to effective national regulation and/or local community pressure. Hence, there is little evidence of either a “pollution haven” or a “race to the bottom.”

105. There is also little evidence that foreign firms consistently perform better in developing countries, especially once the firms’ size is taken into account. In some sectors, notably energy, foreign firms are likely to have superior technology, or close links to “green consumer” markets. In the main, however, foreign links, including export markets and ownership of plant, seem to make little difference to firm performance.

106. The case studies paint a more muddy picture. There are cases of egregious environmental local and even national ecological degradation. While they may not have been drawn in by lower standards, they clearly perform like environmental renegades once they get there. In addition, there is evidence that policy makers are sensitive to potential effects of higher environmental standards on foreign investors. They may not weaken standards, but they don’t enforce them either.

107. On the other hand, there are cases where foreign firms have brought with them higher standards and better management practices, as well as better technology, and cases where foreign firms were the first to respond to consumer pressure for a “greener” product or production process. These improvements, however, have been incremental and have not grappled with larger ecological impacts. “Halos” exist, but, to date at least, they are apparently pretty small.

IV. WHAT RULES FOR FDI ? CONCLUSIONS AND DIRECTIONS

108. The central issue at stake in examining FDI-environment linkages is to determine how best to govern investment in order to maximise positive environmental impacts. The analytical, statistical, case study, and NGO evidence presented in this paper can be synthesised into a number of conclusions.

109. First, the mix of demonstrated positive, negative and neutral effects of foreign direct investment mitigates against any overarching conclusion about its effects “on average.” There is no average, performance is context-dependent and other things are far more important than ownership. If the goal is improvement in industry environmental performance, at both micro and macro levels, then what is needed are traditional and non-traditional (community-based) forms of regulation.

110. Second, a concern to be attractive to foreign investors in a highly competitive global economy has kept a lid on local/national standards or enforcement of standards. While there has not been a universal “race to the bottom,” increased globalisation -- lacking a global regulatory framework -- has inhibited a “race to the top” and caused environmental commitments to be “stuck in the mud.”

111. Third, while “pollution havens” cannot be proven, a pattern of agglomeration of pollution is discernible, one based not on differences in national environmental standards, but on differences in income and/or education of local communities. They may not be “havens”, but there are clearly “pollution zones” of poorer people, both within and across countries, where firms perform worse and where regulation is less effective.⁷

112. Fourth, the quality of the evidence, both statistical and case study, is poor compared to the research needs. Most of the statistical studies rely on very narrow and partial indicators of environmental performance, or use proxies for data that are simply not available. The case studies suffer from data problems as well, including the lack of ecological performance indicators and the lack of analytical frameworks to link macro and micro ecological impacts.

113. Finally, there is a great gulf between what the statistical studies demonstrate and the issues at stake in the debate. Sifting through the evidence thus feels like searching for a small meat ball in a large bowl of spaghetti. In general, the gulf can be characterised as a “micro-macro” problem and reveals the different environmental paradigms at play. Based on a “pollution prevention” paradigm, the statistical and some of the case studies utilise very narrow and partial measures of environmental performance -- often, just one particular pollutant. Environmentalists, however, are concerned not only about pollution, but the “environmental management” of eco-systems as a whole, and more broadly about the “sustainable development” of societies.

114. There is a large gap between even the best of the incremental improvements in company performance and the scale of ecological impact caused by broadly unsustainable production and consumption patterns at the global level. The wealth of northern consumers might help make products marginally “greener,” but it also creates a heavy burden on the earth. It is in this sense that the claim that foreign direct investment is “bad” for the environment has credibility.

115. How, then, to enlarge the environmental benefits of FDI? First, it is clear that regulation matters. While local and national regulation can be effective, there is a great need for an overarching global framework to heighten investor environmental responsibilities and get out of being “stuck in the mud.” Located within a set of global rules governing investment, environmental norms should include both micro level investor responsibilities and macro level sustainability objectives. The process of generating and monitoring global rules should provide ample opportunity for input by environmental NGOs and other community pressure groups.

116. According to French (1998), effective international standards must meet three principles: 1) they should be minimum standards which countries and companies can exceed if they wish; 2) they must be set high enough to have a real impact; and 3) they must be developed via consensus in an open and inclusive process.

117. Second, a global environmental framework of regulation should target not foreign investment, but investment as a whole. Minimum standards should govern any investment project, or at least the larger ones. Such a framework would help to diffuse “best practice” more rapidly, as well as help shift production to greener products.

118. Third, beyond regulation, there is an urgent need for corporate accountability mechanisms. Communities and consumers need access to corporate performance information and corporations need to make such information credible. A good starting point is the creation of Pollutant Release and Transfer Registers (PRTR). Modelled on the US Toxic Release Inventory, PRTRs require companies to track and report emissions. Such information can be used by communities to monitor companies, enhancing

community bargaining power. A PRTR now being established for the three NAFTA signatories will require public disclosure of facility-specific and chemical-specific emissions on both sides of the border. According to Michael Gregory of the Arizona Toxics Coalition, "Disclosure allows comparisons. Without it, we can't pressure the bad polluters and praise the companies that run relatively clean shops" (Gregory, 1998).

119. Fourth, governments need to invest more resources in developing ecological data, especially macro-level performance indicators. The scale impacts of FDI and economic growth as a whole are fundamental to the objective of sustainable development. Consistent and comparable information is needed both for scientific reasons, *i.e.* to determine what the impacts are and how they respond to different policies, and for political reason, *i.e.* to build support for the broad macro-regulatory frameworks that can grapple with the scale impacts of economic growth. Only by changing production and consumption patterns, the kinds of products consumed as well as the quantity of them, will investment truly point towards sustainable development (Sachs *et al.* 1998).

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NOTES

- 1 All international capital flows data from World Bank (1997), Tables 5.2 and 6.10.
- 2 Eleven countries received nearly 80 percent of all FDI flows to developing countries between 1990-1995. In descending order of magnitude, they were China, Mexico, Malaysia, Brazil, Hungary, Indonesia, Poland, Czech Republic, Colombia, Thailand, and Russia.
- 3 Quoted in Deibert (1997), p. 156.
- 4 In the Bhopal case, for example, the human and environmental scale of the Union Carbide disaster was greatly exacerbated by the lack of adequate emergency response mechanisms.
- 5 For a comprehensive literature review, see OECD (1997). See also Adams (1997) and Jaffe et al. (1995).
- 6 Ten case studies of environment-development conflicts made up the project, three of which are focused on cases of foreign direct investment.
- 7 Evidence in the US of the clustering of toxic waste dumps and facilities by race and class can be found in Gelobter (1993) and Goldman and Fitton (1994).