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ENVIRONMENTAL BENEFITS OF FOREIGN DIRECT INVESTMENT: A LITERATURE REVIEW

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FOREWORD

This report presents a literature review of issues associated with the environmental benefits of foreign direct investment (FDI). It reviews recent trends in FDI and looks into specific issues linked to the effects of FDI on the environment, including scale, technology and structural effects. It also addresses issues related to cross-border environmental management, such as industrial, market and regulatory forces. The report concludes with a number of suggestions for further work on the FDI-environment interface.

The report was drafted by Monica Araya from the Yale Centre for Environmental Law and Policy, New Haven, CT, USA and has been revised in the light of comments from Delegates to the OECD Working Party on Global and Structural Policies.

The report is published under the responsibility of the Secretary-General.

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FDI and the environment: scope and methodology of this survey

This document is a review of the available literature dealing with the effects of Foreign Direct Investment (FDI) on the environment, and focuses on the benefits of FDI.

Analytical and empirical work concerning the FDI-environment relationship can be arranged around four clusters:

1. **Competition for FDI and its effects on environmental standards**: Research has traditionally focused on the question of whether foreign investors are fleeing high-environmental standard countries and re-locating to lower-standard countries, thus creating "pollution heavens". A related question is whether competition for FDI is driving environmental standards downwards (a "race to the bottom" hypothesis) or inhibiting standards from raising, thus getting them "stuck in the mud", and leading to what has come to be known as "regulatory chill", not only in the host countries but also in source countries.

2. **Regulatory impacts of investment rules**: This more recent area of work has focused on the question of whether investors' and environmental objectives are compatible. Most of the analysis to date has focused on the North American Free Trade Agreement's investment model (NAFTA's Chapter 11) and the draft OECD Multilateral Agreement on Investment (MAI). However, more recent discussions have focused on regional integration processes and bilateral investment agreements (BITs).

3. **Effects on the environment from FDI flows** : this body of research analyses the effects on the environment due to changes in scale, structure, and technology as FDI flows increase**.**

4. **Gross-border environmental performance:** This cluster of research is perhaps the most recent addition to the research on FDI and the environment. It studies the drivers and leverage points that affect how investors—in particular corporations—perform when they operate abroad.

This document is by no means a comprehensive review of all work on the FDI and the environment; in fact, several reviews of the literature are already available (Zarsky, 1999; Adams, 1997; OECD, 1997; Jaffe et. al, 1995). Instead, the goals of this report are to review *recent* work in the clusters 3 and 4 mentioned above, and to identify trends and unexplored insights that deserve further analysis. Cluster 1 is analysed in detail in the report prepared by the OECD (2002).

The latest survey on FDI and the environment produced by the OECD (OECD, 1999) was used as the baseline. Hence, "recent work" is here defined as the 1997-2002 period. The review of the empirical work included analyses undertaken by *scholars* (economic, legal, environmental and business journals, and special reports); *international organisations* (reports and conference proceedings from OECD, World Bank, United Nations Conference on Trade and Development, United Nations Environment Programme, and the World Trade Organisation); and *specialists* from think-tanks and NGOs.

Trends

Global capital flows have experienced very pronounced shifts in the 1990s. In the last years, the private component of these flows (foreign direct investment (FDI), portfolio investment, and commercial bank lending) has reached new records. Technological change and policy reforms have increased global competition and firms have responded by expanding internationally and investing in newer technologies. Governments, increasingly aware of the importance of private investment, compete to capture private capital flows by accelerating and deepening their liberalisation and reform programs (Thomsen, 2000).

This reinforcing dynamic led to record levels of FDI in 2000 ($ 1.3 trillion) compared to an annual average of $190 billion for the 1988-93 period (UNCTAD, 2001).

In aggregate terms, developing countries have successfully attracted FDI inflows in the 1990s. Such flows totalled an annual average of US$ 46 billion in the 1988-1993 period. By 2000, this had grown to more than US $240 billion (UNCTAD, 2001). In relative terms, Official Development Assistance (ODA) flows are much lower ($53.1 billion in 2000 (OECD, 2001a)), but they still remain a very significant financial source in the developing world.

Most FDI is still occurring within the OECD area. During the period 1998-2000 the "*Triad"*—Japan, the European Union and the United States—accounted for three quarters of global FDI flows and 85 per cent of the outflows (UNCTAD, 2001). And while the developing world is receiving an increasing share of these investments, the distribution of FDI in the developing countries is very unbalanced: three quarters of the inflows go to only eleven economies.[1] From the inflows in the developing world, Asia and Latin America receive about one half and one third respectively, while Africa receives less than 5 per cent (UNCTAD, 2000).

According to UNCTAD(2001), the main traditional factors driving FDI location around the world (large markets, possession of natural resources, and access to low-cost labour), while still relevant, are diminishing in importance. The significance of many *national* markets is diminishing as a result of lower trade barriers and increased regional links. Instead, other factors are increasingly affecting the location of transnational corporations such as policy liberalisation (i.e. favourable regulatory changes), technical progress (i.e. local conditions facilitating efficient operation of multinational corporations' technologies), and managerial and organisational factors (i.e. efficient management practices).

The structure of FDI has also changed. In the OECD countries, flows to the manufacturing sector have generally fallen, in favour of those aimed at the service industries (UNCTAD 2000).

As investment flows increase, their impact on environmental quality and policymaking becomes a necessary, yet difficult task. And while there is still debate on whether FDI works for or against environmental objectives, there is strong case to be made about the central role of FDI in any sustainable development strategy (OECD, 2001b; von Moltke, 2000; French, 2000Gentry, 1999;). FDI provides opportunities for much-needed infrastructure development, technology transfer, and capacity building such as technological, management and environmental training in the state that receives the investment.

As it will be shown in the next sections, statistical and case study evidence shows that FDI creates both benefits and risks. As many studies point out (Jha, 1999; Zarsky, 1999; Blomström and Kokko, 1997), there is no conclusion on the average: The effects of FDI on host countries can be negative, positive, or neutral; the outcome is context dependent. Additionally, in the last years, the research questions seem to have shifted away from a focus on ***whether*** FDI is good or bad for the environment and environmental regulations to questions about ***when*** FDI becomes beneficial for the host country and its environment and why.

One interesting finding of this report is that a more accurate understanding of the rationale behind cross-border corporate environmental performance is necessary for making progress in the debate about FDI and environmental linkages. Although much has been written about firm-level environmental strategy and performance, drivers behind international corporate decision-making has been neglected so far. Hence, this area deserves further analytical and empirical work.

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[1] These countries are Argentina, Brazil, Mexico, Saudi Arabia, China, Indonesia, Malaysia, Singapore, Thailand, and Hong Kong, China (Thomsen, 2000).

But achieving positive cross-border corporate environmental performance is not enough for maximising the potential benefits of FDI flows: good governance in the countries where corporations operate is an equally necessary condition. In other words, taking advantage of the benefits of FDI requires more than "well-behaved" transnational corporations; host countries must be ready to take advantage of such positive effects.

Meeting the dual challenge of promoting better performance of enterprises *and* adequate governance in host countries has led to promising analytical developments. For example, new work has emerged exploring new roles for traditional actors (i.e. source-country and host-country governments, businesses, and banks), but also responsibilities for less traditional players such as non-governmental organisations (NGOs), local communities, and shareholders.

Additionally, there is an increasing interest in understanding the interaction between the different components of portfolio investment flows and the environment (OECD, 1999a). There are three elements of private investment finance, each of which varies with regard to the depth and character of their connection to environmental issues (O'Connor, 2000; Gentry, 1998). Both portfolio equity investments and debt finance (i.e. commercial loans and bonds) can also have important environmental repercussions (see Box 1).

Discussions about the environmental impacts of global private investment finance often focus on FDI. The reason for this emphasis is that the most direct and significant links lie with FDI (and any associated commercial loans) which often goes into facilities (power stations, mines, plants) that may pose clear pollution control and prevention, ecological protection, resource management, and public health issues (OECD, 1997).

Box 1 Private Capital Flows and the Environment

Portfolio Equity Investments

- Portfolio equity investments tend to be **highly mobile and short-term** in their time horizons. The environmental implications of their flows tend to be less clear and more complex than in the case of FDI flows. Initial public offerings (IPOs) and bond placements provide capital to companies (and thus may act like FDI), but once they are sold, they normally change hands many times in secondary markets (such as stock exchanges). This distance attenuates the link between the investor and the entity in which the investment is held. Moreover, many portfolio investors seek to maximise returns in the short term, so environmental risks (which often occur in the long term) tend to be discounted. The search for quick returns also means that portfolio investors may pull out of a sector or a country overnight, if they lose confidence in it.

- **Accountability** for the impacts of portfolio flows, whether environmental in nature or not, is hard to locate. By their very nature, portfolio investment risks are dispersed across a diverse array of holdings, and the transaction costs of obtaining accurate information about the nature of each investment are high (OECD, 1997).

- Some studies have revealed that financial analysts and investors did not fully understand the links between environmental performance, improved competitiveness and financial performance (Schmidheiny and Zorraquín, 1996; Gentry and Fernandez, 1997).

- Yet, the opportunities that portfolio flows present as a point of **environmental policy leverage are becoming more evident**.

  A. Portfolio investors hold the purse strings to more money world-wide than is available from any other type of investment source, dwarfing the resources potentially available from FDI or commercial loans.

  B. Pressure for short-term profitability in these investments may also create incentives to reduce the environmental performance of host firms.

- While some studies (OECD, 1999a; Gentry and Fernandez, 1997) suggest that there is growing evidence of a positive correlation between **good environmental results and good financial performance**, there is lack of widely accepted tools for translating environmental practice into financial value.

- Analysts are increasingly studying the relationship between shareholder value and environmental performance (Dowell *et al.,* 2000). Additionally, the "Dow Jones Sustainability Index" launched in 1999 by the Dow Jones Indexes and the SAM Sustainability Group (from Switzerland) provides a benchmark for financial products based on the concept of corporate sustainability and to measure the performance of fund managers.

- But the mainstream financial community remains **sceptical** about the portfolio equity investment-environment link, and "when the connection is made, it is usually made in terms of environmental risks, not environmental benefits" (OECD, 1999a, p.35). Demonstrating causation—not only correlation—is very important. Although King and Lenox (2001) found evidence of a positive association between lower pollution and higher financial performance, they also found that a firm's strategic position and stable attributes might *cause* this association. For example, there is strong evidence that firms in cleaner industries have higher market valuation, but there is no evidence that firms that increase their production in cleaner industries increase their market valuation. Thus, they argue that making credible calls to firms to become "green" will require researchers to rigorously demonstrate that environmental improvements actually produce financial gain.

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Box 1 continued

Debt

- The connection between debt and environmental performance is becoming increasingly relevant, in particular for the "greening" of FDI. Commercial lending to private companies gives banks a stake in the borrowers' financial successes (or, more precisely, in their failure) and provides banks with an incentive to consider environmental risks. Other debt holders will be more or less attentive to environmental performance, depending on the nature of the instruments they hold (which affects how insulated they are from variations in a company's value), or on the importance of environmental performance to the success of the enterprises in which they have invested. For example, investors in government-issued bonds are likely to be relatively uninterested in environmental concerns, because the connection between government environmental performance and the ability to repay is somewhat remote (Gentry, 1998).

- The link between banks and environmental issues usually arises in the course of the banks' evaluation of the potential borrower's creditworthiness, which helps them assess borrower's ability to repay the loan. According to a survey by Ganzi and Tanner (1997), less than half of the 51 respondents "always" or "usually" require that environmental due diligence be performed on lines of credits, project finance transactions, or equipment financing. Frye (1998) suggests that whether a lender has an explicit policy objective of environmental protection, or whether the lender views environmental issues only in terms of minimising losses and maximising returns, lenders have made and continue to make important contributions to environmental protection as a necessary by-product of their efforts to identify and minimise their risks.

- Among the advantages of lenders' involvement are: forced assessment of environmental impacts, third party review of the potential project's environmental aspects, improved technologies or practices, expedited cleanup, continued oversight, and insurers as additional third party (Frye, 1998). See Pearce and Ekins (2001)' proposal for international financial institutions and their role promoting sustainability.

- Other work (O'Connor, 2000; Gentry, 1998) suggests that an even more positive finance-environment link emerges as banks discuss why and how they may profit from financing investment in environmental technologies and projects. Although traditional infrastructure projects are still financed by multilateral banks, private infrastructure financing has been growing in recent years (i.e. water supply, sewage treatment, and waste treatment).

Effects of FDI on the environment

Most of the expected environmental effects of FDI are studied by decomposing them into scale effects (expansion of economic output), structural effects (reallocation of production and consumption), and technology effects (technological development and diffusion). In general, scale effects are expected to be negative, while technological and structural effects are expected to be positive (i.e. the service FDI flows as opposed to manufacturing FDI). From an analytical perspective, what becomes relevant is the net outcome of the three effects, not the individual parts. A survey of recent work also suggests that the net effects are sector and context dependent (Zarsky, 1999).

Identifying "net effects" of FDI on the environment is a complex task and, therefore, empirical studies of this nature are rather scarce. Two limitations might explain why research on the "net effects" of the FDI-environment relationship is difficult to conduct. First of all, it will always be difficult to clearly separate the environmental effects of domestic economic activity from the effects from activities of foreign affiliates. Secondly, FDI does not occur in a vacuum. Therefore, environmental effects cannot be analysed in isolation from the other related factors. The investment-trade linkage is a case in point. As O'Connor (2000) points out, trade affects the potential market for a country's output. In resource-intensive industries,

for example, trade facilitates a larger scale of resource extraction. And while the scale effect would tend to dominate, it could be offset by increase average efficiencies in the extraction and processing technologies. So far, the environmental repercussions of the trade-investment nexus remain largely unexplored in the literature. As it will be stressed in the conclusions, this is an area of future research that deserves greater support.

Undoubtedly, discussing evidence in this survey of the "net effects"—rather than partial effects—would have been desirable (in fact, it was one of the main motivations behind this survey). Yet, this is not feasible, due to a lack of comprehensive studies. For example, UNCTAD (1999b) points out to empirical evidence suggesting that some industries could be highly polluting (i.e. chemical and allied products, mining for minerals and metals, pulp and paper, fabricated and non-fabricated metals, cement, glass and ceramics). However, data shortfalls do not allow testing for a precise correlation between the potential pollution intensity of such industries and FDI flows. In the end, the UNCTAD study concludes that the net effects of FDI depend on a combination of macro-micro issues. The key macro issues include the profile of FDI. For example, the type of industry in which FDI takes place, and the extent to which it involves pollution-intensive activities. Key micro issues are related to the specific decisions that multinational enterprises make with regard to the management of the production activities and the diffusion of environmentally friendly technologies. The following sections explain each component (scale, composition, and technology) of the FDI-environment nexus and recent empirical work.

Scale effects

Scale effects relate to the impacts on the environment as a result of incremental economic activity. As trade and/or investment expand, the use of natural resources is expected to increase as well. For a given pollution coefficient and a given composition of production, the scale effects on the environment are expected to be negative, largely because increased production will require not only the use of new resources (such as energy and water) but also the generation of waste. However, the size of these effects is the subject of considerable debate (Nordström and Vaughan, 1999). An understanding of the specific scale effects will depend on the particular environmental factor under investigation (OECD, 2001b).

But even though scale effects are expected to be negative for the environment, the silver lining is that as income grows, there are more *possibilities* for achieving higher demands for environmental quality, which are more likely to become a political priority among citizens. Moreover, as income grows, governments could also have more possibilities to invest their additional wealth on sound environmental policy.

At least *some* empirical evidence suggests that pollution increases at the early stages of development but decreases once a certain income level is reached (Dasgupta *et al,* 1995). The existence of an "inverted-U" relationship between pollution and development is known as the environmental Kuznets curve (EKC) (Andreoni and Levinson, 2001; Panayotou, 1997; Grossman and Krueger, 1995; Seldon and Song, 1994). FDI becomes relevant to the EKC debate to the extent that investment is expected to contribute to economic growth, especially in the host country.[2]

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[2] There has been a debate on *when* and *how* FDI contributes to economic growth. For empirical discussions about FDI and growth, see De Mello and Ruiz (1999) whose study suggest that FDI is growth-enhancing depending on the degree of complementarity between FDI and domestic investment and Borensztein et al, (1998) who suggest that FDI contributes to growth to the extent that sufficient absorptive capability of the advanced technologies is available in the host country.

Although microeconomic evidence suggests that increased incomes augment demand for environmental quality (McConnell, 1997), the willingness to pay for different categories of environmental quality is far from being uniform. An extensive analysis of the EKC is beyond the scope of this survey, but it is critically important to underscore that the ongoing debate suggests that the EKC hypothesis is valid for some types of environmental indicators, and equally invalid for other important indicators (Munasinghe, 1999; Barbier,1997).

In a thorough review of the evidence supporting and contesting the EKC hypothesis, Nordström and Vaughan (1999) conclude that the U-shaped pollution path seems to hold for several local, primary urban, pollutants (air, and –to a lesser extent–freshwater pollution), but does not seem to hold as pollutants become greater in scope, in particular CO_2 emissions. Additionally, Panayotou (2000; 1997) suggests that since current income levels of developing countries are nowhere close to the "turning point", pollution and resource intensive production would continue for a long time, which could lead to significant and possibly irreversible damage.

The implication for the FDI-environment discussion is that it would be incorrect to assume that environmental effects of FDI-led growth will *automatically* be offset as income increases. An increased willingness to pay for higher environmental quality will not happen by compelling necessity (Nordström and Vaughan, 1999).

These scale effects of FDI (as well as those resulting from trade-led growth) have become a central concern for environmental advocates. Many critics of further economic growth expect the scale effects from trade and investment liberalisation to be not only negative, but also unsustainable for global ecosystems (Daly, 1996). However, the lack of data and analytical work in this area makes it difficult to have a scale-focused debate.

Given the difficulties of conducting research that addresses net environmental effects of further FDI flows, researchers have chosen more pragmatic approaches. Recognising the difficulties of arriving at general conclusions vis-à-vis FDI in the developing world, case studies from India, Malaysia, and China reckon that only partial conclusions can be drawn from the analyses. In these three cases, there are examples of positive and negative effects. The case study of India (Jha, 1999) shows that FDI has had a mixed record regarding environmental performance. There have been cases about negative environmental performance of transnational corporations, especially in the 1980s, which led to a heated debate and increased NGO action. A vast gap emerged between the claims from NGOs concerning the environmental and health risks posed by foreign investors and what the companies claimed they were actually doing. However, in more recent years, some positive examples of multinational corporations (MNCs) behaviour have taken place in the service sector, in particular activities of MNCs producing solar power, waste management consulting, and water cleaning services.

Technology effects

Technology effects emerge especially when the liberalisation of investment flows drives a more rapid rate of technology development, diffusion and (sometimes) transfer. Such processes may involve the transfer of physical goods and/or the transfer of tacit knowledge (UNCTAD, 1999). Since the technologies used by foreign direct investors tend to be less polluting and use fewer resources, technology effects are expected to be positive (or neutral), depending on whether they improve eco- and resource efficiency (OECD, 2001b).[3]

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[3] These effects are also associated with freer trade, in fact, the OECD (1995b) has suggested that 75 per cent of international technology transfer arises from trade flows and 18 per cent from investment flows.

Technology transfer and its potentially positive effects on environmental quality have been a common interest of academic and policy debates. It is impossible to cover in this survey all the literature on what conditions ensure that technology transfer takes place and why.[4] While such research does not always cover environmental issues explicitly (i.e., the transfer of clean technology) it helps the discussion about FDI and the environment to gain insights into why and when positive linkages between foreign investors and the local industry occur. [5]

Why may FDI bring beneficial technological effects? Several factors are explained below.

The arrival of newer and better technologies

The technology that foreign investors bring with them is *likely* to be relatively advanced, newer, and less environmentally damaging than the one available in the host countries (OECD, 2001b; OECD, 1995a). When MNCs establish themselves in foreign markets, they have to overcome hurdles (such as unfamiliarity with domestic markets and local customs, or unpredictable regulatory systems), and technological advantages can become their most relevant competitive "edge" over domestic producers (Grossman and Helpman, 1995) and competitors.

Guoming et al (1999) point out that some investors brought new technologies, better environmental practices and environmental infrastructure that ware not previously available in China. The lack of data, however, makes it difficult to quantify the national scale effects of these environmental management improvements.

What analysts suggest is that, in the short term, the immediate recipients may benefit as they achieve higher levels of productivity and/or lower costs. In the long run, their benefits depend on how much they learn from the technology and are able to deepen and develop their own capabilities. Developing countries cannot expect that by increasing FDI inflows to their economies, foreign investors will necessarily transform their technological bases. What technologies and functions FDI actually transfer to a particular country will also depend on local capabilities, to an important degree (UNCTAD, 1999b).

Recent case studies from the mining sector and the pulp and paper industry highlight the role of FDI in promoting clean technology transfers.

Many countries, which are dependent on the exports of minerals, are receiving increased flows of FDI, especially as a result of the privatisation of state-owned companies (UNCTAD, 1999b). The modernisation of such enterprises and the inflows of new investment into new projects usually enhance the prospects for better environmental performance. Innovations such as energy-efficient "flash" smelters, biotechnology-based leaching alternatives to smelting, and continuous-concentration processes are substantially reducing the overall use of resources (energy in particular) and the damage to water, air, land, and ecosystems (Warhust and Bridge, 1997).

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4 For an overall discussion about technological transfer see UNCTAD (1999, Chapter VII), OECD (2001, Chapter 6).

5 See for example UNCTAD's latest World Investment Report (2001) focuses on the question of "promoting linkages" among transnational corporations and local firms.

Warhurst (1999) conducted 25 case studies[6] analysing the diffusion of four clean technologies in mineral extraction and the potential of FDI as a conduit for clean technology transfer. What the studies suggest is that *technological collaboration* between suppliers and recipients—in particular intensive training—can contribute to improved environmental performance and enhanced environmental management capacity. However, in order to do so, the recipient must have mechanisms to both retain capacity, and to diffuse it systematically throughout the operation. Unless these mechanisms are in place, the study suggests that the capacity transferred through collaboration could be lost over time, or may remain concentrated in only one part of the operation. In other words, FDI's technology transfer does not occur automatically - opportunities need to be purposefully harnessed by both suppliers of technologies and recipients. The adoption of cleaner technologies in the mineral sector as part of FDI is happening in developing countries and transition economies particularly in green-field investments; but also at existing sites where there is significant investment in capacity extension. Another finding from the study is that the uptake of cleaner process technologies (and opportunities for enhanced environmental management) only occurs if the process offers savings when compared to other commercially-available processes. Thus, environmental advantages *per se* were not sufficient to ensure the adoption of the cleaner technologies in the cases analysed.

A study on the pulp and paper industry in Chile suggests that there are not substantial differences between foreign and domestic-owned facilities (Herbert-Copley, 1998 cited in UNCTAD, 1999b). The study shows that the dominance of outside supplier and equipment firms and consulting engineering companies have left limited scope for dramatic differences in mill design in terms of control and technologies. Export market pressure has a common influence on both foreign and domestic-owned firms, which leads to similar types of environmental changes (i.e. decreases in the use of bleaching). The role of lenders has also influenced their behaviour since funding from international agencies has been subjected to similar environmental performance criteria.

Local spillovers

In addition to technology transfer, foreign investors can also create other positive technological spillovers to national firms, through imitation, employment turnover, and supply chain requirements (e.g. demanding higher quality standards. Whether local firms try to imitate multinationals' technological practices ("reverse engineering") will usually depend on the stringency of the local intellectual property rights regime (Panayotou, 2000; Blömstrom and Kokko, 1996).

Other spillovers arise as local firms employ staff previously employed by the multinationals, thereby gaining access to expertise which may not be readily available locally, particularly if the multinationals have strong training programmes for their staff. Finally, the presence of multinational enterprises also appears to generate technological spillovers amongst supplier industries. By demanding particular quality standards, and providing the technical assistance needed to meet these standards, multinationals can help upstream industries to improve their technological efficiency (Blömstrom and Kokko, 1996).[7]

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6 The countries analysed were Australia, Bolivia, Brazil, Chile, China, Papua New Guinea, Peru, Russia, South Africa, and the USA.

7 Ford Motors, after getting certified all its plants around the world under ISO 1400 (106 manufacturing facilities in 25 countries),- will require certification by all suppliers. Specifically, Ford is requiring suppliers to certify at least one manufacturing site to ISO 14001 by the end of 2001 and all manufacturing sites shipping products to Ford by July 1, 2003 ("Supplier Certification" available at http://www.ford.com, visited 9/10/2001). ISO 14001 is an environmental standard under which independent auditors evaluate environmental processes and system performance.

Several examples of spillover effects from MNC operations in developing countries have taken place in the Chinese context. Eriksen and Jansen (1998) point out to the international environmental activities in China, from Novo Nordisk, (a pharmaceutical company and one of largest Danish MNCs) which developed a joint venture with the Suzhou Hongda Group in the production of starch-degrading enzymes for the alcohol industry. As a result untreated water is no longer discharged, but processed through biological wastewater treatment plants which reduced the organic material by 90 per cent. Also, in 1997 Novo Nordisk plants were opened in Tiajin with state-of-art technology and environmental management.

According to Gouming et al (1999) there are examples of MNCs transfering environmental managerial skills related to environmental management to their Chinese partners. The authors also offer several examples of MNCs that are providing environmental services in China—such as waste management and cleaning projects— and others that bring environmentally friendly technologies. Some of the MNCs cooperate with the Chinese government in dealing with environmental problems. Among the examples of transfer of environmentally sound technologies through FDI the authors point out to the establishment of facilities that provide environmentally related services (i.e. sewage disposal, sulphur-detachment, and garbage disposal). Also, some MNCs operating in China promoted the upgrade of technology in local industries and help domestic industry to manufacture products using less pollution and energy (fluorine-free refrigerators and pharmaceuticals). There have been improvements in the electricity generation plants and the supply of technology for more efficient energy use and alternative energy sources.

Christmann and Taylor (2001)'s study found evidence that customer linkages (and ownership) contribute to environmental self-regulation for a sample of 118 firms operating in China. In particular, they show that firms that sell a large proportion of their sales to MNCs within China are more likely to adopt ISO 14000 than other firms. (However, the hypothesis that such firms would have better environmental compliance than other local firms was not supported by the data).

Garcia-Johnson (2000) presents evidence of linkages between chemical MNCs operating in Mexico and Brazil that led to adoption of new environmental practices. In the first case, exporting firms in the Mexican chemical industry "imported" corporate, voluntary programs such as Responsible Care.[8] US affiliates operating in Mexico made the adoption relatively easy for the Mexican industry. MNCs and local industries developed a cooperative and mutually supportive partnership in order to ensure the passage of NAFTA, to improve the competiveness of the Mexican chemical sector and, to a lesser degree, to enhance the public opinion about the chemical industry and to prevent strict regulation in Mexico. The study shows that firms within the industry share information about technology and pollution preventive practices and that those firms unwilling to cooperate have been expelled from the Mexican chemical industry association.

In the same study Garcia-Johnson shows that Brazilian chemical industry was less receptive to Responsible Care. Among the reasons that explain the difference between the Mexican and the Brazilian responses are market and ideological considerations. For example, the sheer size of the domestic market and Brazil's dominance in the Common Market of the Southern Cone (Mercosur) made the Brazilian industry less concerned about meeting environmental demands in the US market. The negative image of the chemical sector was not—according to Brazilian industry leaders—as pressing of a problem as their

[8] Responsible Care was created by the largest American chemical companies and involves a self-regulatory program encompassing guiding principles and six management codes. The code is implemented by the companies's main trade group the Chemical Manufacturer Association (CMA) and was created in the aftermath of the Union Carbide's accident in Bhopal, India (Reinhardt, 2000). The official information about Responsible Care is found at the Chemical Manufacturers Association's website <www.cmahq.com>

American and Mexican counterparts perceived. Finally, the foreign origin of Responsible Care created some resistance in Brazil. After several years, the program has led to increased communication and co-operation among industry members but smaller, domestically oriented companies are less enthusiastic about the program.

Unfortunately, whether the adoption of voluntary environmental practices by the local industry (such as Responsible Care) is in fact increasing the environmental quality in the developing country remains yet to be empirically tested. What a study from King and Lenox (2000) suggest is that effective industry self-regulation is difficult to maintain without explicit sanctions.

More financing

Financial constraints are among the most important barriers to investment in environmentally-preferable technology (OECD, 1995b). In some cases, these constraints have arisen from national policies towards foreign capital, such as foreign exchange restrictions and international credit. Thus, liberalisation of capital flows, especially FDI, can be beneficial by offering greater financing opportunities for investments in equipment and by investing in research and development (R&D) overseas (Panayotou, 2000; Gentry, 1998). By giving firms access to foreign sources of savings, the internationalisation of capital flows could also ease financial constraints, which prevent firms from investing in potentially more efficient, and less environmentally-damaging capital equipment.

Negative effects also occur

Some countervailing tendencies may result in multinationals applying relatively more damaging technologies. For example, capital operating in regions with the weakest environmental regulations may face incentives to use cheaper (and perhaps, more environmentally damaging) technologies in specific sectors. There is anecdotal evidence from China where certain town and village enterprises of rural China accepted high-polluting equipment from developed countries because it was cheap (OECD, 1997).

Guoming et al (1999) point out to other examples of poor environmental performance by Asian investors in China, especially in the past. The sectors involved were mainly toy, leather, footwear, and plastic manufacturers. Their production led to negative environmental and health impacts. Rasiah (1999) also provide examples of negative environmental practices by MNCs in Malaysia in the past involving the chemical production (from a British subsidiary), copper mine activities (a Japanese-Malay company), and the storage and disposal of radioactive effluents (a Japanese firm).

In addition, some question whether technological progress is spreading globally. Some studies suggest that overseas multinational R&D is concentrated only in few countries. There is little evidence that R&D is being undertaken on a significant scale by transnational corporations in developing countries (Freeman and Hagedoorn, 1995); some seem to converge technologically, while others are left behind (Panayotou, 2000). It has been estimated, for example, that technology generation is usually concentrated in large firms, typically transnational corporations from OECD countries, and that 90 per cent of world R&D spending is concentrated in only seven countries (UNCTAD, 1999b).

Structural effects

Structural effects are associated with the adjustments within and between economies that occur when the *pattern of resource use* shifts (OECD, 2001b). To the extent that trade and investment liberalisation promote allocative efficiency among economies, structural effects are expected to be positive: goods will be produced with lower input and capital per unit of output world-wide.

A structural shift seems to have taken place in FDI (inward) stocks. According to UNCTAD (1999b), FDI destined to primary sectors has declined by half between 1988 and 1997 (from 8.6 per cent to 4.5 per cent) in developed and in developing countries. At the same time, the services sector has experienced a corresponding increase in both categories of countries in the same period. Several questions emerge regarding the service FDI and environmental issues.

Is this structural shift toward service FDI positive from an environmental perspective? Some analyses suggest the answer is yes (OECD, 2001b; Gentry, 1998). The thesis here is that newly industrialising countries have received increased environmental quality from the structural changes as they have shifted from the primary sector to resource processing and now to light manufacturing and services; the latter step being particularly beneficial from an environmental perspective. But since each type of service generates different environmental impacts (i.e. compare finance versus air transport, for example) more research will be necessary in order to quantify and understand better the variety of environmental repercussions

UNCTAD (1999b) suggests not only that the services sector faces pressures for environmental improvements, but also that the savings resulting from better environmental practices may be higher here than in any other sector. It also points out to some examples in the tourist industry (some hotels, for example) is seeking to be more environmentally efficient (i.e. measures in energy and water conservation and in waste reduction).

Another case study of tourism services concludes that the effects on the environment are both positive and negative. While such services generate income and incentives to protect natural resources and create infrastructure, some problems emerge as the leakage of profits send many profits away to the operating countries and companies, while the environmental impacts stay in the host developing country (WWF, 2001).

In the air transport and shipping industries, there are pressures to reduce noise and limit the chances of an ecological disaster. The financial services are also facing some environmental pressure vis-à-vis the types of projects that receive financing and the preconditions that need to be met.

A different line of analysis relates to the question of whether structural changes in the global economy that favour service sector in OECD countries may shift some manufacturing industries from developed countries into rapidly industrialising economies which could have some negative environmental implications (O'Connor, 2000). Testing this hypothesis will require further empirical analysis. So far, UNCTAD's data (1999b) suggest that outward services-based FDI of developed countries has been growing—not decreasing—over the past decade at a faster rate than FDI in any other sector, increasing its share from 45 per cent in 1988 to 56 per cent in 1997. But again, empirical work will be required in this area in order to check whether manufacturing FDI has been shifted to developing countries in spite of the

increase of services FDI.[9] For example, one important aspect to consider is the extent to which growth in service FDI is related to growth in manufacturing FDI. Some data suggest that many services affiliates are established not only by services multinational enterprises but also multinational enterprises, in primary and manufacturing industries (i.e. trading affiliates) (UNCTAD, 1999b).

Cross-border corporate environmental management

A growing, and perhaps more pragmatic, body of analytical and empirical work has gone beyond the focus on FDI *location* and its effects on environmental regulations. What seems to be a new generation of questions emphasises corporate environmental performance: what happens once the foreign affiliate has been established in a particular country, and what environmental management approach is chosen and why?

A key to understanding the environmental implications of FDI in host countries is the type of environmental management strategies adopted by foreign investors (Hansen, 1999; UNCTAD, 1999b; UNCTAD 1993b). While much has been said about environmental management at the national and plant level, the way enterprises address environmental issues as their operations become more global remains largely unexplored.

The review of this area of work focuses on the factors that lead to the differences in environmental performance across borders. Foreign investors can choose among a wide range of environmental strategies, from comprehensive ones that ensure its world-wide environmental costs are internalised, to those that go no further than compliance with local regulations. Some multinational enterprises leave all environmental issues to be addressed at the level of their foreign affiliates (a "decentralised" strategy), others centralise environmental decisions for a corporation as a whole; seeking to ensure similar environmental performance among affiliates regardless of where they operate. In general, smaller enterprises seem to follow a decentralised strategy whereas bigger multinational enterprises tend to follow a centralised line (UNCTAD 1999b). But size is not the only factor that makes a difference. The literature reviewed suggests several additional elements: ownership, industry-, market-, and regulatory forces.

Ownership

Whether ownership makes a difference in environmental performance is still controversial. There is no systematic evidence allowing for a general conclusion (UNCTAD 1999b). What does recent evidence tell us? Eskeland and Harrison (1997) concluded that foreign companies were cleaner and had lower levels of energy use in the countries from the sample (Mexico, Venezuela, and Cote d'Ivoire). Blackman and Wu (1998) also found significant support for the argument that foreign investments are "cleaner". Their cases suggest that foreign investment in electricity generation in China increased energy efficiency and reduced

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[9] The analysis from UNCTAD (1999b) on outward FDI shows that the share of pollution intensive manufacturing industries in total outward FDI stock did not exceed 16 per cent in 1996. Industrial composition of outward FDI stock from selected countries The analysis of the inward FDI stock shows no particular pattern either in developed or developing countries either for the share of pollution intensive industries in total FDI or in manufacturing FDI. But data suggests that when it comes to industrial composition of investment, the ratio of pollution-intensive industries in FDI stock appears to be higher than in domestic investment, in both developing and developed countries. But it is important to consider that the data used for this type of analysis might over or underestimate the share of pollution intensive activities across sectors and manufacturing. Neither does the data capture that there are varying degrees of environmental damage.

emissions. This positive effect was driven by the focus of FDI on advanced generating technologies, better management, and competitive forces.

According to Christensen and Taylor (2001)'s research on firms operating in China, multinational ownership positively affects both environmental compliance and ISO 14000 adoption. Rahiah (1999) points out that American, European, and Japanese MNCs in the electronics sector tend to use better environmental practices than East Asian firms. Size and market-orientation seem to be the most important variables explaining the differences in environmental practices in Malaysia. However, he also points out that in the past, there have been cases of environmentally inferior machinery transferred from MNCs to Malaysia because of lower environmental standards prevailing in the country.

In the past, however, other studies found no evidence that foreign ownership had a significant effect on environmental performance (Hettige *et al,* 1996). A case study of Mexico (Dasgupta *et al*., 1998) found that foreign ownership did not affect the environmental performance of firms. Instead, other aspects such as the size of the plant and the public scrutiny had a more direct influence on company performance. Moreover, one study of manufacturing in Korea (Adan *et al*, 1999) suggests that domestic firms performed better than foreign firms (as measured by level of spending pollution abatement). The authors suggest that domestic firms might be trying to reduce their emissions in order to improve their public image.

Industrial forces

Hansen (1999) suggests that the basic features of an industry (level of concentration, collaboration and collusion) have direct impacts on the nature of cross-border environmental practices among its members. In concentrated industries, firms will be in better position to set off environmental costs since they have a higher degree of market control (i.e. oligopolistic industries). Additionally, higher international environmental standards are more likely when close industry collaboration happens. In the past years, some industry associations have engaged in collaborative approaches such as the development of internal codes of conduct, guidelines, and voluntary standards.

The study from Christmann and Taylor (2001) mentions that one of the benefits of globalisation is that it encourages industry to engage in environmental *self-regulation* ("a firm adoption of environmental performance standards or environmental management systems (EMS) beyond the requirements of government regulations" (p.1)). Moreover, the study argues that self-regulation by MNCs and their suppliers complements traditional government regulation and could be an alternative in the countries where the formal regulatory process fails. They suggest that findings of that nature (that self-regulation is happening in developing country in both MNCs and local firms) can help explain the lack of evidence for pollution heaven hypothesis. Also, the aforementioned study from Garcia-Johnson (2000) is an example of industrial forces shaping change within the chemical sector. The study empirically supports the idea that MNCs operating in Brazil and Mexico are "exporting environmentalism" via self-regulation programs such as Responsible Care.

Market forces

Commercial and financial factors can both lead to improvements in environmental performance strategies. Gentry (1998) shows the positive FDI-environment synergies that emerge as a result from competitive advantage in the marketplace. His agricultural case studies show that the pressure from export consumers, combined with the need to cut production costs, and some government programs led to improved environmental performance in Costa Rica (banana exports) and Brazil (pulp and paper production). The first case involved an "environmental" certification scheme for bananas, which led to the reduction of chemical intensity and irrigation in banana production. The second case illustrates how the

Brazilian pulp and paper industry has improved and has created interest in developing a national certification system through the Forest Stewardship Council (FSC).

Christmann and Taylor (2001) also provide evidence that customer linkages affect the environmental approaches chosen by firms operating in China. According to the study, firms that sell a large proportion of their output to developed countries have better environmental compliance and are more likely to adopt ISO 14000 than other firms.

Stock performance can be influential as well. A study by Dowell *et al.* (2000) shows that US-based multinational enterprises that adopt high environmental standards abroad carry higher market values than those corporations that adopt environmental standards in foreign operations that are lower than domestic level. Some studies suggest that information about poor environmental performance can have negative effects on the investors' capital market values. For example, Dasgupta *et al.* (1998) have shown that negative environmental information affected capital markets in Argentina, Chile, Mexico, and The Philippines. Some anecdotal evidence also shows a link between stock market performance and environmental behavior. A World Bank (2000) case study in Indonesia illustrates that the largest pulp producer benefited from improved environmental performance which had become so good "that the company's stock value has increased while the Jakarta composite stock index has plunged 60 per cent during the current financial crisis" (p. 58).

Formal regulatory forces

Studies show that enterprises investing abroad are influenced by host country regulations (O'Connor 2000; Gentry, 1998; UNCTAD, 1993b). Gentry (1998) conducted a case study including 44 foreign investors (mostly from the United States) in the Mexican manufacturing sector. The results show several positive technological effects, in particular water treatment facilities, which led to higher eco-efficiency of operations more than 70 per cent of the time. Mexican regulations—including, to some extent, better enforcement—was a key motivator in the investor's decision to undertake an "environmental investment".

But the implementation of the law in developing countries is rather weak and problems with enforcement are not rare. For example, Jha (1998) has identified weaknesses in the Indian context; Rasiah (1999) has analysed problems in Malaysia; and Gouming *et al* (1999) offer insights of the enforcement problems faced in China, A case study from Costa Rica also illustrates some of the deficiencies in the application of environmental regulations vis-à-vis Free Zone Areas (Gentry, 1998).

The potential role of binding source-country environmental regulation on corporate behaviour abroad has not yet been fully explored. Past discussions (UNCTAD 1993a) had emerged in the context of cross-border environmental liability, but no recent empirical work has been conducted in this area.[10].

In the absence of binding source-country rules for corporate conduct overseas, FDI promotion agencies in developed countries could play a complementary role. Evidence from Denmark suggests that an investment promotion agency may have been of significance for the international conduct of Danish investors (Eriksen and Hansen, 1999). The promotion agency has developed a set of environmental guidelines that are mandatory for all the partners (50 per cent of all Danish investment projects in developing countries). The guidelines address several commitments: a) compliance with host country regulations; b) a "Best Practice Declaration" in which deviations from the Danish environmental

10 Bhagwati (2002) offers a case for binding rules in the source countries for corporate environmental conduct overseas but he does not tackle the issue through an empirical lens.

regulations are identified and quantified; and c) an assessment of critical environmental parameters in order to establish whether the agency can accept participation in the investment project. There is also a post-investment procedure that involves monitoring of environmental indicators.

Another case study from the Earth Council (1998) in Sakhalin shows that companies undertook an environmental impact assessment of large scale oil drilling only were they were pressed, mainly by multilateral finance agencies. In fact, several regional banks now have an environmental component (and conditionality, in some cases) built into their lending operations (i.e. the World Bank's environmental guidelines).

Source-country governments can also enhance the synergies between FDI and the host-countries by using development assistance to improve corporate performance (Riva and Moretz, 1999). In Denmark, the official international aid agency (DANIDA) has created programs that support joint ventures between Danish investors and the local industry with a focus on transfer of technology and skills (Ericksen and Jansen, 1998). In order to have access to financial and organisational support from DANIDA Danish partners must comply with a set of requirements developed by the agency. One example resulting from this program is a joint venture between a Danish refrigeration manufacturer and a Zimbabwean company that led to building new facilities with state-of-art technology. Finally, a similar project from the Danish government—this time from the Ministry of Environment and Energy—encouraged Danish companies to participate in environmental projects in Malaysia and Thailand. One project financed under this initiative a partnership emerged between a Malay palm oil manufacturer and a Danish company that has the technology to turn into energy the waste generated from the palm oil industry.

Informal regulatory forces

There are 60,000 MNCs driving the global expansion of investment flows with more than 800,000 affiliates abroad (UNCTAD, 2001). Formal regulation is not the only tool capable of to affecting corporate environmental conduct. In fact, governments in source- and host-countries often lack the tools to monitor, let alone to regulate the behaviour of these enterprises (White, 1999). As a result of this reality, non-state actors have become engaged players trying to affect corporate behaviour directly. Such informal efforts—also known as "civil regulation" (Newell, 2001)—usually take place in the source-countries and call for further environmental disclosure, reduced environmental impacts, and for adherence to codes of business conduct. Much of such NGO action—especially aggressive campaigns against specific corporations—becomes effective when enterprises bear a global brand.[11] As *The Economist* (2001) points out, the more power and importance of a brand, the more vulnerable it becomes: A hint of scandal regarding poor environmental performance may affect customer attitude vis-à-vis the company. Another example of NGO action toward the surveillance of activities of MNCs is the establishment of "MNC monitors" (e.g. "Corporate Watch" and "OilWatch") that seek to deter companies from violating their obligations by threatening exposure and/or boycotts against them (Newell, 2001).

As a result of such initiatives and the increased exposure of the public opinion to corporate behaviour, societal scrutiny of corporate behaviour has increased in the past years. Such scrutiny targets

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[11] For example, in 1999 Rainforest Action Network (RAN) claimed victory in a two-year campaign against Home Depot, the U.S. home supply and building materials retail giant. After RAN organised demonstrations at Home Depot stores, hung banners outside the company's headquarters and waged letter-writing and full-page ad campaigns in national newspapers, Home Depot agreed to stop selling products made from old-growth wood. The homebuilding industry at large followed suit, saving 7.5 million acres of coastal forest in British Columbia alone (*Institutional Investor Magazine*, 2000).

not only environmental conduct, of the parent company, but also the performance of its affiliates. For example, a campaign of a coalition of over 200 NGOs from different countries is advocating an "International-Right-to-Know" legislative proposal that would require U.S. companies to report on the key practices of their overseas operations, environmental management being one of them. The proposed environmental issues that MNCs would have to disclose include toxic releases, air and water pollution, and natural resource extraction.[12] As MNCs continue to expand their operations, campaigns of this nature—targeting cross-border environmental performance and increased disclosure—are likely to increase in the future.

Additionally, global voluntary strategies have emerged within inter-governmental fora, which offer a benchmark of what good corporate practices are. Examples of such international initiatives include the OECD Guidelines for Multinational Enterprises, and the United Nations Global Compact. These international codes of conduct are voluntary and could become an important complement of formal regulatory efforts (Haufler 2001; Aaronson, 2001; OECD, 2001c).

"Shareholder activism" has also become—especially in the US and the UK—a component of NGO action seeking to influence corporate behaviour. In order to obtain access to and have an influence in the general meetings and other fora within a company, environmental groups buy a number of shares. As shareholders they try to overturn corporate decisions or to promote activities that they find environmentally responsible (Newell, 2001). Lewis (1997 cited in Newell) reports that one UK arm of Shell International had an uncomfortable confrontation with its institutional shareholders in 1997 because of its environmental and human rights record in Nigeria. A group of shareholders holding 1 per cent of the company led to a new report by Shell of its global health and safety activities and a new version of its Statement of General Business Principles which now include human rights and sustainable development (Caulkin, 1997 cited in Newell, 2001).

Informal forces in the host countries can also play a role in affecting foreign investors' environmental performance. There is evidence that local community pressure is playing a dynamic role (World Bank, 2000; Zarsky, 1999). This "informal" approach to regulation seems particularly important, especially in countries where traditional regulation and law enforcement is weak.

The World Bank (2000)'s report on prospects for "greening the industry" analyses several success stories of how local communities have driven improvements in corporate environmental performance (e.g. Indonesia's largest pulp producer).

A case from Indonesia (Earth Council, 1998) shows that the companies analysed responded to local community pressure and improved their environmental performance. Sari (1998) also found that local community pressure in Indonesia effectively forced the clean up of toxic and hazardous wastes in the industrial zone of Batu Ampar.

And while a strong case for proactive communities is increasingly made, the role of market agents and regulators remains relevant and complementary. In other words, analytical work in this area is not a case against regulators, but a case for rethinking their responsibilities in a way that enables communities and markets to exert maximum influence on polluters (World Bank, 2000; Zarsky, 1999; Gentry 1998).

[12] For more information see the official website http://www.irtk.org/ of the campaign.

Final remarks and suggestions for further work

At least, four conclusions can be drawn from the review of recent empirical work on the environmental aspects of FDI.

There is no overarching conclusion

The recent work exploring the effects of FDI on the environment confirms previous results by other authors (Zarsky, 1999; UNCTAD, 1999b): There is no conclusion "on the average", effects can be positive, negative, or neutral. Specific results are context-dependent.

The studies analysing the effects on the environment concentrate in one dimension of the FDI-environment taxonomy (either scale, technology, structural composition), but seem to fail in putting all the pieces together. As Nordström and Vaughan (1999) suggest, the separation into three effects is important for analytical purposes, but the net result is what counts. Unfortunately, the literature continues to be devoid of any concrete results vis-à-vis *net* effects.

An interesting question that needs to be further explored is whether the structural shifts that most economies are going through, reducing the share of manufacturing and increasing the share of services (e.g. electronic commerce, tourism, financial services) is as environmentally-benign as some analyses suggest.

Much less empirical work exists on a question that has been central for environmentalists: whether FDI-led growth will be within the global ecosystems carrying capacity, even in the presence of positive technological externalities that lead to a decreased pollution intensity per unit of output.

Local institutions make a difference

An important lesson stemming from the analysis of the mining sector in 35 countries with respect to technology transfer -a key potential benefit of FDI–is that such transfer requires a local capacity to assimilate, diffuse, and retain the technologies. Simply put, transfer does not happen automatically.

With the right institutional framework in place, FDI can become a constructive "engine" for sustainable development in many countries. The main environmental opportunities associated with FDI arise from the fact that FDI promotes higher incomes, which could lead to higher levels of investment in pollution prevention and control facilities. There is also the possibility of tapping into the better technologies, information, management systems, and training programs that foreign investors often have at their disposal. But these opportunities, as the cases here have shown, are not guaranteed.

If policy and institutional failures are not addressed, higher incomes associated with FDI-induced growth may not "pull" environmental quality along with it fast enough. Even where there is a positive relationship between income and improved environmental quality, this nexus may not turn out to be strong enough to prevent absolute degradation in environmental quality from occurring (OECD, 1997).

In other words, the institutional structure of the recipient country ends up being more important than the actual level at which environmental standards have been set. Environmental laws and requirements provide the goals, but whether there is really any environmental improvement associated with these laws depends heavily on the quality of the associated implementation effort (Esty and Gentry, 1997). In this sense, the cases studied here suggest that community pressure might complement the role of the

government in forcing improvements, especially in the face of poor corporate environmental performance and weak law enforcement.

The promotion of best corporate practices has also become a positive supplement to formal regulations to the extent that may motivate improvements in the environmental performance of enterprises when they operate abroad, especially in poor countries. The results from the studies represent a case for "rethinking" roles and responsibilities - not a case against regulation itself.

Corporate environmental performance: identifying key leverage points

As studies suggest, a key to understanding environmental repercussions of FDI lies in the corporate environmental practices adopted by the foreign investors. Studies show that the kind of environmental practices chosen by enterprises will depend on size, market, industry, and regulatory forces, both formal and informal.

Although corporate environmental performance in general, and in in poorer countries in particular, is becoming an important public topic, the research explaining why environmental performance differs remains, surprisingly, minimal. One plausible explanation is that the data necessary for studies of this nature are simply lacking especially because environmental disclosure about operations overseas remains voluntary. As more information becomes available, further work in this area would help understand with more precision what drivers and leverage points are found in both host- and source-countries. Such analytical exercise could also shed some light on how important the endogenous drivers are (e.g. firm characteristics) versus the exogenous ones (e.g. market, industry, regulatory forces).

Other relevant linkages to FDI

FDI does not occur in a vacuum. It will be increasingly difficult to isolate the FDI-environment relationship into scale, technology, structural, regulatory effects without considering the FDI connection to trade trends (their influence on market opportunities), commercial lending (whether and how environmental conditionality from lenders affects foreign investors' performance), and shareholders' value (does better environmental performance lead to higher market values? and why?). Understanding these linkages will be increasingly important to the policymaking process and for those stakeholders trying to influence corporate behaviour, especially in poorer countries.

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