

Cross border environmental
management in transnational
corporations.

An analytical framework.

By Michael W.Hansen

Occasional paper no. 5

Report as part of UNCTAD /CBS Project:
Cross Border Environmental Management
in Transnational Corporations

© Copyright by CBS, June 1999

For further information:

www.ikl.cbs.dk/departments/ikl/cbem

Background to paper

The globalization of economic activity in general, and the growing role of transnational corporations (TNCs) in particular, have increasingly directed attention toward the environmental consequences of these developments. Increasingly, TNC activity in developing countries has become an issue for various normative initiatives at the international level, in the OECD and in the WTO. However, there remains a pertinent need to gain a better understanding of the environmental implications of TNC activity in developing countries. On this background, the United Nations Conference on Trade and Development (UNCTAD) and Department of Intercultural Communication and Management, Copenhagen Business School (DICM/CBS) in 1997 received a grant from the Danish International Development Agency (DANIDA) to conduct a study of environmental practices in TNCs. The project is called: "Cross border Environmental Management in Transnational Corporations". The project examines environmental aspects of foreign direct investment (FDI) in less developed countries by conducting case studies on environmental practices in Danish and German TNCs with operations in China, India and Malaysia. The project will produce a series of research reports on cross border environmental management seen from home country, host country as well as corporate perspectives. The reports will serve as input to a conference on Cross Border Environmental Management hosted by UNCTAD.

Abstract

A key to understanding the effects of foreign direct investment on developing host countries is the environmental management practices adopted by foreign investors. Whereas environmental management at the national and plant level is a well described phenomena, little is known of whether and how firms are organizing environmental dimensions as they become internationalized. The concept of 'cross border environmental management' has been coined to capture this international aspect of environmental management. The concept refers to those TNC environmental management practices that concern foreign activities, be they of equity or non-equity nature. This paper outlines the main features of cross border environmental management practices and proposes a model for analyzing its dynamics.

Please note that the views and opinions expressed in this paper reflect those of the author and do not necessarily represent those of UNCTAD and CBS.

Table of contents

I. INTRODUCTION.....	1
II. THE STATE AND CONTENT OF CROSS BORDER ENVIRONMENTAL MANAGEMENT ..	3
1. THE CONTENT OF CROSS BORDER ENVIRONMENTAL MANAGEMENT PRACTICES.....	3
2. A TYPOLOGY OF CROSS BORDER ENVIRONMENTAL MANAGEMENT	5
<i>a. Managing controlled affiliates.....</i>	<i>5</i>
<i>b. Managing non-controlled foreign entities.....</i>	<i>7</i>
3. EMPIRICAL STUDIES OF CROSS BORDER ENVIRONMENTAL MANAGEMENT.....	8
4. SUMMARY	11
III. EXPLAINING CROSS BORDER ENVIRONMENTAL MANAGEMENT	11
1. THE BASIC DISTINCTION: TNCs BETWEEN LOCAL ADAPTATION AND GLOBAL INTEGRATION	12
2. A FRAMEWORK FOR EXPLAINING CROSS BORDER ENVIRONMENTAL MANAGEMENT	13
3. THE DETERMINANTS OF CROSS BORDER ENVIRONMENTAL MANAGEMENT PRACTICES	14
<i>a. Regulatory forces.....</i>	<i>14</i>
i. International environmental regulation of TNCs	14
ii. Home country environmental regulation	15
iii. Host country regulation.....	16
iv. Summary	17
<i>b. Market forces.....</i>	<i>17</i>
i. Green markets.....	18
ii. Just in time delivery and quality orientation	20
iii. Summary	20
<i>c. Industry forces.....</i>	<i>21</i>
i. The level of industry concentration and collaboration	21
ii. Summary.....	22
<i>d. Company specific forces</i>	<i>23</i>
i. The nature of the production technology	23
ii. The environmental history from home countries.....	23
iii. The size and international orientation of the TNC	24
iv. The international strategy and organization	24
v. Ownership	25
vi. Summary	26
IV. CONCLUSION AND AVENUES FOR FUTURE RESEARCH.....	27
LIST OF REFERENCES.....	30

Cross border environmental management in transnational corporations.

An analytical framework.

By Michael W. Hansen

I. Introduction

Firms are increasingly engaging in value adding activities based on cross border transactions. In doing this, firms have various internationalization modes at their disposal. Historically, the preferred mode has been trade. However, within the last 15 years international production has taken precedence over trade making one observer argue that *"the traditional international economy of traders is giving way to a world economy of international producers"* (Root, 1990). A firm organizing production across borders is normally referred to as a transnational corporation (TNC)¹. By internalizing functions such as production, marketing or finance across borders, the TNC provides one of the most significant economic links between countries. The level of cross border internalization is indicated by the level of foreign direct investment (FDI) ². Since the mid eighties, FDI by TNCs have displayed phenomenal growth rates and at \$400 Billion in 1997 FDI inflows is a central factor in the economic development of many countries³. In particular in

¹ A transnational corporation is defined as a firm having productive activities in two or more countries. The predicate 'transnational corporation' was introduced by the United Nations in the early seventies, but covers roughly the same phenomena as the more commonly used terms 'multinational corporations' or 'multinational enterprises'.

² FDI is normally defined as investment made in another country with a view of getting control over foreign assets. UNCTAD defines FDI as *"an investment involving a long-term relationship and reflecting a lasting interest and control of a resident entity in one economy in an enterprise resident in an economy other than that of the foreign direct investor"* (UNCTAD, 1995). Typically, cross border investment is registered as FDI if the company contributes at least 10% of the investment capital in a project.

³ The level of foreign direct investment may seriously underestimate the actual importance of TNCs. Increasingly, various non-equity means such as licensing, franchising or sub-contracting are being exploited in firm's internationalization process. Also joint ventures are common, although they seem to be declining. Recently, cross border strategic alliances - for instance in regard to R&D or marketing -

many developing countries, the inflow of FDI plays a pivotal role in the economic development process.

The proliferation of international production - in its various forms - has increasingly brought into focus the environmental aspects of this process. A passionate debate whether TNCs are undermining countries' efforts to achieve sustainable development or on the contrary are essential prerequisites to sustainable development has taken place. On the one hand, it has been argued that TNCs are relocating polluting production to developing countries, that TNCs are transferring environmentally inferior technologies and practices to their foreign subsidiaries and that TNC subsidiaries are marketing products banned or severely restricted in their home countries (Ives, 1985, Castleman, 1985). On the other hand, it has been argued that TNCs are beneficial to the environment, for instance due to their huge potential of facilitating the transfer of cleaner technologies and environmental know-how from North to South (Wescot, 1991, Wallace, 1996). One of the main issues of contention in the debate over TNCs and sustainable development has been whether foreign ownership leads to superior environmental performance of TNC affiliates vis-a-vis non-TNCs⁴ or whether the influence of foreign ownership on environmental performance is negligible compared to factors such as technology, scale and host country regulation⁵. In recent years the debate on TNCs and the environment has matured and a consensus seems to be emerging that TNCs are probably both 'boon and bane' in regard to sustainable development (Gentry, 1999). Instead of sustaining antagonistic positions, it seems that efforts in both academia and policy circles now are converging around unraveling the conditions under which TNCs are either 'boon or bane' as well as outlining, how TNC's positive contribution to sustainable development can be enhanced.

A key to understanding the effects of FDI on host countries is the environmental management practices adopted by foreign investors. Whereas environmental management at the national and plant level is a well described phenomena, little is known of whether and how firms are organizing environmental dimensions as they become internationalized. The concept of 'cross border environmental management' has been coined to capture this international aspect of environmental management (Hansen/Ruud, 1996, Hansen, 1998). The concept refers to those TNC environmental management practices that concern foreign activities, be they of equity or non-equity nature. This paper will outline the main features of cross border environmental management practices and propose a model for analyzing its dynamics.

has proliferated (Dunning, 1997).

⁴ This positive correlation between foreign ownership and environmental performance has been suggested by e.g. Royston, 1979; ILO, 1984; Pearson, 1985; ESCAP/UNCTC, 1988; Leonard, 1988; Rappaport et al, 1991; Eskeland and Harrison, 1997; or Blackman and Wu, 1998.

⁵ That foreign ownership makes little difference in relation to environmental performance has been suggested by Huq and Wheeler, 1993; Hartman et al, 1995; Pargal and Wheeler, 1996; Dasgupta et al, 1998; Jenkins,1999; or Zarsky, 1999.

II. The state and content of cross border environmental management

Environmental management is by now a well-established discipline within business management. Environmental management is broadly understood as the objectives, standards, procedures and practices that a company sets up to manage environmental challenges. Typically an environmental management system consists of various objectives and standards for environmental performance, procedures for control and enforcement, and a formal allocation of responsibilities among employees and functions. For commercial reasons, a company will sometimes prefer to have its environmental management system certified by an external party. Typically, such certification will take place according to one of the international environmental management standards, e.g. the BS 7750, the EMAS or the ISO 14000.

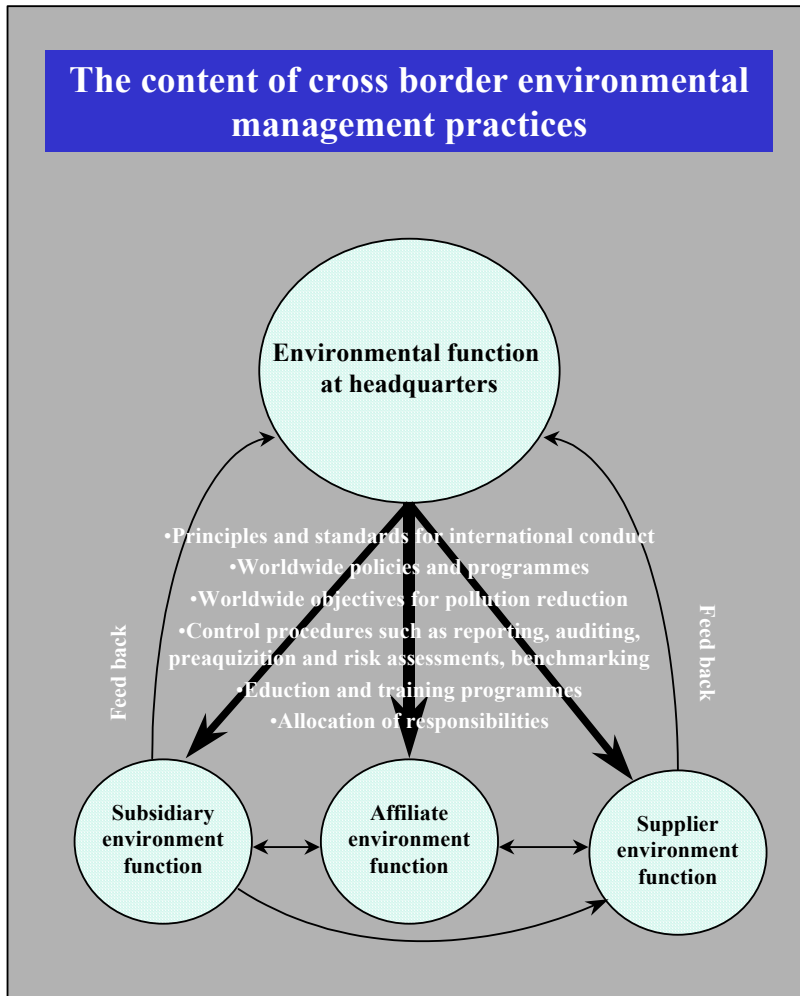
As firms internationalize through equity and non-equity means it becomes increasingly meaningless to confine the environmental management dimension to national boundaries only. Thus, the environmental management system in TNCs will sometimes have an element geared toward managing activities of foreign operations. This element is what we label 'cross border environmental management'. The cross border environmental management practices are the environmental bridge between headquarters and foreign affiliates. Although cross border environmental management is a relatively new discipline within corporate management and although cross border practices generally are little standardized and formalized, some general features of cross border environmental management practices can be identified:

1. The content of cross border environmental management practices

While there are many means by which a TNC can manage environmental dimensions at foreign affiliates, a cross border environmental management system will typically have at least five elements⁶. *First*, it will consist of some general principles for the environmental activities of the entire corporation. These overall principles are typically stated in the corporate mission or as it is sometimes labeled, 'the environmental policy statement'. These policy statements may set out overall targets and objectives for the environmental conduct of foreign affiliates. The targets and objectives could for instance be that the company will comply with regulations of host countries, that all affiliates will meet company standards, or that the company strives to become an environmental leader in all locations. *Second*, more specific policies and

⁶ The following is mainly based on Hadlock 1994 and UNCTAD 1993.

programs that are applicable throughout the corporation may accompany the general principles of the policy statement. These policies and programs will typically exist in areas that the company assign particular importance, e.g. energy conservation, waste-minimization or air pollution. Sometimes specific targets for reduction of pollution emissions or consumption of raw materials



will be stated in such policies. *Third*, a cross border environmental management system will consist of various procedures for monitoring and controlling whether the environmental conduct of the foreign affiliates are operating in accordance with regulation and standards outlined by headquarters. This can be pre-acquisition assessments, environmental reporting procedures or auditing procedures. In recent years, transnational corporations have increasingly implemented computerized and company-wide accounting and reporting databases. The information collected through these systems can be used in the strategic planning of environmental investment

throughout the corporation. The databases enables headquarters to get an overview of the corporation's total impact on various types of pollution, to benchmark different units against each other, and keep track of - on a daily, weekly, monthly or yearly basis - developments on environmental dimensions. *Fourth*, the company may have training, education and information exchange programmes and activities aimed at providing environmental guidance and facilitate a high level of awareness and competence at all levels of the corporation. *Finally*, a cross border environmental management system may be embedded in a formal organization, where responsibilities and functions are delineated and allocated between entities and persons.

Sometimes a cross border environmental management system will be highly rudimentary; sometimes it will be extremely elaborate. Sometimes it will include 100% controlled subsidiaries only, at other times it will include non-

controlled affiliates and even suppliers and subcontractors. Finally, the degree of formalization of a cross border environmental management system can vary significantly; from highly informal and ad hoc based procedures to a closely integrated system with detailed manuals specifying procedures and principles for conduct.

2. A typology of cross border environmental management

a. Managing controlled affiliates

Given the potential for variation in the scope and content of cross border environmental management, it is useful to make a distinction between different archetypes of cross border environmental management. The environmental management literature contains quite a few examples of typologies of environmental management strategies⁷. Normally, these typologies characterize environmental strategies along the dimension apatic - reactive - proactive. A striking feature of these typologies is the lack of focus on cross border aspects of environmental management. In the following section we will propose a typology of cross border environmental management organizations. The typology largely follows the logic of Bartlett and Ghoshal's (1989) ideal types of TNC's cross border organization⁸.

Based on this logic, the cross border environmental organization can be characterized as a continuum spanning from total independence of the affiliate environmental function to total integration of the affiliate in the environmental function of headquarters. At the 'lowest' level we find an organization form that might be labeled "*Decentralized*". In an environmental sense, the affiliate pursues a 'stand alone' strategy. This organization is characterized by the absence of cross border environmental policies, programmes and procedures. Environmental problems are seen as the responsibility of local managers, and will be solved solely at their discretion. There is no liaison between headquarters and affiliates regarding environmental dimensions.

However, most TNCs have established a certain degree of cross border environmental management. Thus, headquarters in most larger corporations seek to ensure that foreign affiliates comply with existing regulations and laws no matter where they operate. The management strategy behind this practice is to ensure "*International compliance*". The purpose of cross border environmental procedures is to make sure that all affiliates around the world

⁷ See for example Steger (1992) or Roome (1992)

⁸ Bartlett and Ghoshal make a distinction between Multinational, International, Classic Global and Complex Global organizations. The first category depicts a situation where subsidiaries are largely stand alone operations. The second refers to a situation where subsidiaries are thinly integrated. The Classic Global organization refers to a situation where the subsidiaries are totally integrated and subordinated headquarters strategies and in fact become replica of home country operations. The Complex Global category refers to a situation where affiliates are self-standing entities but fully integrated in the overall strategy of the company.

have taken the necessary measures to ensure that they operate in accordance with the laws and regulations of the host country. These measures will typically be pre-acquisition assessments, compliance auditing, monitoring and reporting procedures. As one of the main problems of environmental protection in many host countries is the lack of effective enforcement rather than the lack of environmental rules and regulations, a TNC commitment to comply with all rules and regulations regardless of location might be of some consequence.

While both the previous modes of organization are characterized by local adaptation of environmental practices, some corporations seem to strive for a perfect alignment of environmental policies, programmes and procedures throughout the corporation. Typically, the environmental management system in the home country is used as the basis for the management framework of the entire corporation, and company standards and procedures are implemented regardless of local requirements. This type of set up we will label "*Centralized*". Like companies pursuing a compliance strategy, companies in this category are internalizing environmental controls out of fear that regulatory controls in host countries may be inefficient, insufficient or too costly to adapt to. However, this centralized mode of organization further internalize environmental standards; that is, instead of observing varying standards and regulations in the multiple settings they operate, they adopt company wide standards that are applied at all facilities regardless of location. Evidently, these company internal standards must meet or exceed standards in all major locations that the company operates in. By centralizing the environmental management function, risks are minimized, economies-of-scale are obtained and costly retrofitting in case of changes in host country regulation is avoided. The environmental focal point for local management becomes the environment function at headquarters rather than the local regulatory authorities and in an environmental sense, the local affiliate insulates itself from local regulatory demands and becomes a replica of home country operations.

Finally, a fourth way of organizing cross border environmental management can be outlined based on the logic of Bartlett and Ghoshal's framework. This we will label '*Globally integrated*'. Where the environmental governance system in the case of a centralized organization is highly hierarchical in that environmental management of affiliates is integrated vertically, the governance system in the case of TNCs pursuing a '*Globally integrated*' strategy is integrated horizontally. Initiatives to new measures can come from any facility in the corporate network, state-of-the-art clean technologies and practices can be developed at production facilities in any country, and environmental managers at various production facilities are more related through merits and competence than through rank and file. Individual units are allowed a high level of discretion in regard to adapting to local conditions, however within the boundaries set by the principles and strategy of the corporation. Instead of centralized control from headquarters, company internal benchmarking systems are created, where the performance of

individual units constantly is measured against each other. Goals are under this system set locally but driven globally by the overall philosophy and objectives of the corporation.

Table 1. A typology of TNC cross border environmental organization

	Decentralized environmental management	International compliance	Centralized environmental management	Globally integrated environmental management
Environmental management focus	Local adaptation	Host country legislation	Home country legislation/ company standards	Company standards/ International standards
Typical policy statement	None	"Meet and comply with all standards nationally and internationally."	"Employ the same standards and criteria world-wide."	"Strive to become global environmental leaders"; "Acknowledges responsibilities for the global environment "
Worldwide environmental policies and programmes	None	None	Pollution prevention; Waste minimization; energy conservation; safety zones in LDCs; toxic education programmes	Green R&D; Climate change policies; Bio diversity programmes; Dialogue with external stakeholder
Cross border environmental control procedures	None	Procedure to ensure compliance with regulations home and abroad: Pre acquisition assessments; regulatory compliance auditing; monitoring procedures	Procedures to ensure vertical integration: Auditing according to company internal standards; reporting, green accounting; training programmes	Procedures and activities to ensure horizontal integration: Information exchange; life cycle analysis; third party auditing;
Sectors	Industries with minor environmental risk; SME TNCs	Chemical (pre Bhopal); large diversified companies.	Chemical (post Bhopal)	Pharmaceuticals

b. Managing non-controlled foreign entities

The environmental implications of international production may extend beyond equity relations. Non-equity means of international production - e.g. franchising, licensing, subcontracting and strategic alliances - are becoming increasingly common, making the boundaries of the firm more 'fussy'. One of the features of international production frequently cited in the TNC literature is the proliferation of so-called 'integrated production networks' across borders (UNCTAD, 1993d). Integrated production networks are made possible by various technological developments such as the spread of computerized

production and information technology, the reduced transportation costs and liberalized policy frameworks for trade and investment. These developments allow companies to break down the value chain in discrete parcels and source - through equity or non-equity means - the elements of the chain according to locational advantage, thus creating internationally integrated production networks. The difference between integrated networks and traditional arms-length transactions is that the level of interdependence and thereby the level of cooperation and coordination among entities is exceptionally high.

The implications of the proliferation of non-equity links in general and integrated production networks in particular have rarely been analyzed from an environmental perspective. Nevertheless, various possible procedures and practices in relation to non-controlled partners and collaborators abroad can be identified. Basically, a distinction between backward (supply chain management) and forward (product stewardship) oriented management procedures and practices can be made. In regard to the former, a typical tool employed by some of the largest TNCs is to screen suppliers by asking them to fill out a questionnaire, where they report on various environmental dimensions. In some instances on-site audits can take place although it rarely will have the same intensity as auditing of subsidiaries⁹. Also subcontractors may be screened, in particular if they offer environmentally sensitive services such as waste management. On rare occasions, TNCs may set environmental standards for suppliers apart from those concerning the product quality. Finally, TNCs may offer technical assistance regarding environmental problems to affiliated companies in the network.

In regard to product stewardship, TNCs may also adopt practices applicable regardless of location. This could be procedures for prior informed consent (PIC) in the case of transfer of hazardous products and technologies to developing host countries. It could also be training and education programmes for the appropriate use of the product, e.g. training programmes for the use of pesticides. Appropriate labeling may also be an essential element in TNC product stewardship programmes, especially in regard to the handling of chemicals.

3. Empirical studies of cross border environmental management

While the international environmental management responsibilities of TNCs have been subject to much public debate, surprisingly little research deals with this aspect of TNC behavior. However, in particular in the wake of the Bhopal catastrophe, the issue was taken up by several researchers as this accident in many's view was a consequence of management failure (Gladwin, 1987b, Bowonder, 1987).

⁹ Nike and Reebok are examples of TNCs auditing suppliers in this manner.

Based on existing studies, there is evidence to suggest that cross border environmental management practices are becoming increasingly widespread among TNCs and that cross border environmental management is a discipline within corporate management rapidly in the process of being formalized and standardized. Thus, a handful of studies have suggested that the largest TNCs are integrating the environmental management function globally. Rappaport et al (1991), in a study of 98 US multinationals with affiliates in Mexico and Brazil, found no systematic differences in EH&S performance between OECD and developing country operations of the participating corporations. The surveyed TNCs largely implemented the same management systems regardless of location and 20 percent of the respondents reported having an explicit statement "*to meet or exceed US laws overseas when foreign law is less stringent*". A study by Ruud (1995) examined environmental management and technology transfer in large aluminum producers through detailed case studies at OECD and developing country operations. This study found that TNCs involved in bauxite mining in developing countries, had adopted state-of-the-art environmental practices, e.g. in regard to land reclamation, regardless of local requirements and regulations. Brown et al (1993) studied the implementation of strong environmental commitments at Asian affiliates of US TNCs. In particular, the study focused on the bargaining relationship between developing countries' host governments and US based TNCs. Three major corporations - Xerox, Occidental and Du Pont - were surveyed and the dynamics of implementing EH&S standards at different stages of an investment cycle were examined. The main conclusion was that while the surveyed corporations had a firm policy of applying the same environmental standards regardless of location, this objective was extremely difficult to sustain in the political, social and economic context of developing countries. Nevertheless, these companies allocated substantial additional resources to the enforcement of company standards at the developing countries affiliates and frequently it was the TNC rather than the host government that brought the issue of environmental measures into the negotiations of new investment projects.

In 1991, the United Nations Centre on Transnational Corporations conducted the hitherto most comprehensive study of environmental management in TNCs. The study involved analysis of environmental management practices in 169 of the largest TNCs worldwide. This survey revealed that the bulk of TNCs has a rather reactive approach to the environmental challenge, especially in regard to operations in developing countries. However, a proportion of the companies were, according to this report, moving toward more proactive strategies: Around 40% of the respondents had company wide environmental policies, and a handful had adopted an explicit and publicized policy of implementing home-country standards in international operations; 45% of the responding companies reported that they had made a formal allocation of environmental responsibilities between headquarters and developing countries affiliates and that extensive communications between headquarters and affiliates took place on environmental issues; 60% of the responding companies conducted

company wide EH&S audits; and a small group of companies were extensively involved in highly innovative environmental practices in developing countries, practices such as supporting local environmental groups, devising reforestation programs, protecting wildlife habitats, developing local environmental infrastructures, etc. (UNCTAD, 1993).

However, there are also studies questioning the picture given by these studies. A number of comprehensive studies of EH&S practices in TNC developing country affiliates (UNIDO, 1991, ESCAP/UNCTC, 1988) from the late eighties suggested that the best available technology at reasonable costs were rarely employed in developing countries; that many TNCs observed local standards only and not corporate standards; that TNCs were conducting audits more frequently in OECD countries than in developing countries operations; and that the technologies used in developing countries generally were environmentally inferior to those employed at OECD production facilities. ESCAP/UNCTC (1988) concluded a study of TNC environmental practices in six Asian countries that "*the home based operations of TNCs are generally found to have better health and safety performance as compared to their foreign subsidiaries, especially those in developing countries*". A comprehensive study by ILO (ILO, 1984) of occupational health and safety performance differentials between home and host countries in seven TNCs, concluded that while the health and safety policies and regulations of the home country constituted the basic framework throughout global operations of these TNCs, the developing countries affiliates had a lower performance than their home country operations. The low EH&S performance was largely accounted for by implementation problems in developing countries caused by factors such as different climatic conditions, different cultures in the workforce with respect to health and safety consciousness, and difficulties with subcontractors (ILO, 1984; 72).

Castleman (1985) found that many TNCs employ dirtier and more dangerous technologies in developing countries, in particular in industries producing substances such as asbestos, cobber and lead, vinyl chloride and pesticides. More recently, Chang Xing (1995), in a study of 19 TNC affiliates in pollution intensive sectors in China, found that the environmental managers of these companies generally were unaware of the existence of European management standards, and that none of the affiliates surveyed implemented European environmental management standards. Moreover, several companies reported that they did not yet fully comply with Chinese technical regulations. A study of 112 Danish TNCs from 1996 (Hansen, 1998) found that only around 12% of the respondents strived to meet Danish environmental standards when operating in Eastern Europe and developing countries and that only 17% had formal environmental control and reporting procedures between headquarters and foreign affiliates. The main reason for this low degree of formalization of cross border environmental controls in Danish industry was suggested to be related to the fact that a large proportion of the responding Danish TNCs was relatively small in an international context.

Concerning the extension of environmental management practices to non-controlled units, very little is known, but it is probably safe to conclude that only few TNCs are extending their environmental practices to suppliers/subcontractors and non-controlled affiliates in the host countries. For instance, the UNCTAD study (1993) found that only 15% of 169 TNCs with sales over \$1 Billion had allocated environmental responsibilities with non-controlled affiliates.

4. Summary

With the rapid proliferation of international production, a host of environmental questions are being raised. One of these questions is, how TNCs organize the management of environmental dimensions at foreign affiliates, if at all. This aspect of a company's environmental management function is referred to as 'cross border environmental management'. Cross border environmental management is broadly understood as the principles, objectives, policies and practices directed at managing the environment at foreign affiliates. This section presented various cross border environmental management practices and offered a typology of cross border environmental management strategies based on the level and nature of integration of the affiliate's environment function. The review of existing studies of TNC cross border environmental management practices indicated that the literature is rather inconclusive in regard to the state of cross border environmental management. It was suggested that cross border environmental management definitely is an emerging discipline within corporate environmental management but also that TNC responses to environmental challenges in host countries varies greatly, from total neglect to state-of-the-art practices. A particularly fruitful avenue for future research will thus be to examine, under which conditions TNCs may produce favorable environmental responses in regard to activities in developing host countries and under which conditions they will not. Thus, the following section will offer a framework for analyzing the conditions of cross border environmental management.

III. Explaining cross border environmental management

It seems that cross border environmental management is an emerging discipline within corporate environmental management. But it is also evident that not all TNCs are engaged in such practices. Therefore it is essential to obtain a better understanding of under which conditions TNCs may engage in such practices. This not least in a policy perspective; only through a comprehensive understanding of the dynamics of cross border environmental management will policy makers be positioned to design regulation in a way that to the largest possible extent builds on - and not counter - the powerful forces of internationalization.

1. The basic distinction: TNCs between local adaptation and global integration

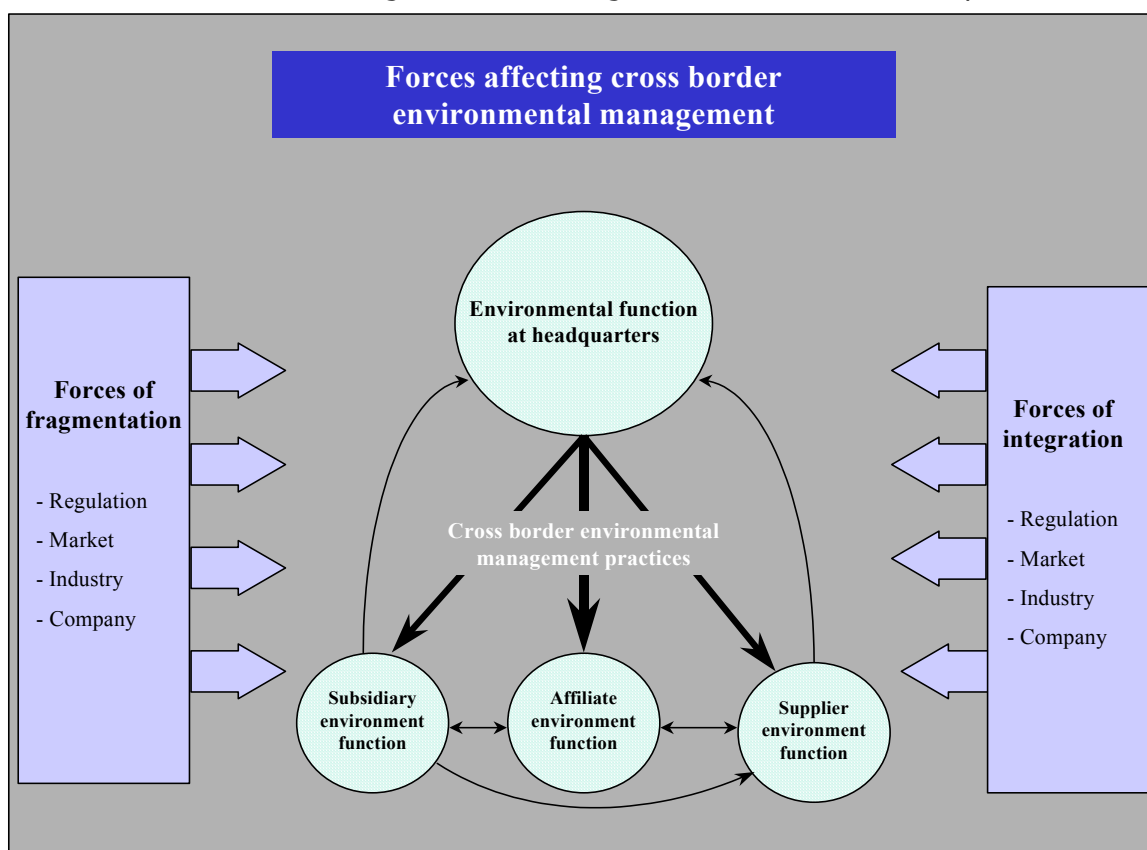
When TNCs continue to expand international operations in spite of the numerous disadvantages that they face vis-à-vis locally based companies, it is because they can exploit two apparently contradicting characteristics of international production. On the one hand they can devise production globally in order to take optimal advantage of differences in country characteristics and endowments. On the other hand, by standardizing international production, management, technology, marketing and training across borders, TNCs can get a series of scale advantages vis-à-vis local corporations, what Kogut (1985) calls '*cross border scale economies*'.

These conflicting forces also characterize the way companies organize environmental activities across borders. On the one hand, TNCs can be expected to organize environmental management and the deployment of technology so as to exploit location specific environmental advantages of host countries. In line with this, it has been predicted that TNCs move production with high pollution abatement costs to less developed countries where control costs generally are lower than in the OECD countries (Walter, 1973). In the literature on TNCs and the environment this has been called '*industrial flight to pollution havens*' (Leonard, 1988). Moreover, it has been predicted that TNCs internally may devise technologies and managerial know-how to exploit differences in regulatory intensity between countries. In the literature on TNCs and environment this phenomena has been labeled environmental '*double standards*' (Castleman, 1985). A less value laden notion is that the environmental practices are '*fragmented*' (Gladwin, 1987). On the other hand, TNCs can be expected to transfer home country environmental technology and know-how and integrate and standardize environmental management internationally. According to this line of thinking, the relevant environmental standards of TNC affiliates are not necessarily those of the host country but rather those of the home country. Instead of devising different production set up and management systems for different locations, TNCs may want to organize the production of environmental quality across borders by transferring the cleanest and most efficient technologies, by devising standards world-wide that are independent of and often beyond local regulatory standards, and by establishing various environmental control procedures of subsidiaries. Thereby, the subsidiary's environmental function becomes an integrated element in the worldwide organization of the company.

To sum up, the environmental practices of TNCs seems poised in a conflict between forces of local adaptation and global integration like it is the case with the international organization of production in general. The challenge is to identify these forces of integration and adaptation.

2. A framework for explaining cross border environmental management practices

The nature and extent of cross border environmental management practices must be understood in the economic, organizational and regulatory context in which a company internationalize. The factors affecting cross border environmental practices can roughly be consolidated into four forces: Regulatory forces; market forces; industry forces, and company specific forces. 'Regulatory forces' refer to the characteristics of a TNC's regulatory context – for instance the level of host country, home country and international environmental regulation - that forge certain environmental responses in TNCs



involved in international production. 'Market forces' refer to the characteristics of the market in which the TNC operates – for instance the strength of green sentiments among consumers and customers - that may affect corporate environmental conduct. 'Industry forces' refer to characteristics of an industry - such as the level concentration and collaboration in the industry - that may affect cross border environmental practices. 'Company specific' forces refer to those firm specific characteristics of an TNC's organization and assets that may influence, how it manages the environment. It should of course be noted that to consolidate the determinants of cross border environmental management into these four forces is a simplification; the four forces are by no means mutually exclusive, and alternative categorizations could have been envisioned.

3. The determinants of cross border environmental management practices

Keeping in mind that cross border environmental practices of TNCs are affected by forces associated with regulation, markets, industry and company, the paper will now move on to examine in more detail, how these forces may affect cross border environmental management practices in TNCs:

a. Regulatory forces

Almost without exception, surveys of environmental management conclude that environmental management is driven by regulation. In countries with a litigious regulatory climate such as the US, this factor seems relatively important; the risks of huge fines and penalties appear to encourage corporate self-policing (UNCTAD, 1993). The question is, to what extent also cross border environmental management practices are influenced by regulation. Here it is useful to make a distinction between the influences of international regulation, home country regulation and host country regulation:

i. International environmental regulation of TNCs

The obvious place to look for regulatory pressures for cross border environmental management is in international environmental law. Cross border environmental practices could simply be a reflection of international provisions requiring TNCs to observe certain standards in their international operations. However, judging from existing international law, this factor seems negligible in that there are only few international regulations constraining the environmental practices of foreign investors. Exceptions are the Montreal Protocol, which prohibits companies from relocating CFC production to developing countries where CFC production remains legal and the NAFTA agreement which prohibits companies to relocate for environmental reasons¹⁰.

While there are few international binding provisions for TNC's environmental conduct, there are several provisions in more soft environmental law. For instance, Agenda 21 contains 32 references to the responsibilities of TNCs¹¹. OECD has included a chapter on the environmental responsibilities of TNCs in its Guidelines for Multinational Enterprises¹² and the

¹⁰ The draft text of the now moribund MAI also contained specific environmental provisions for TNCs. Also, the Basel convention prohibits the transfer of scrapped production equipment to developing countries, but this is mainly a trade issue, not a production issue although there may be border cases where a TNC is transferring an old production technology to affiliates in developing countries. The European Energy Charter also have environmental provisions for EU companies investing in Eastern Europe.

¹¹ However, most of the 32 references to TNCs in Agenda 21 focus on environmental problems related to trade practices and are therefor not TNC issues proper.

¹² The Guidelines are from 1977, the environmental chapter from 1991. In light of the recent failure to establish a Multilateral Agreement on Investment (MAI), the OECD is currently concentrating its efforts

OECD Guiding Principles for Accident Prevention explicitly states that "*hazardous installations in non-OECD countries should meet a level of safety equivalent to that of similar installations in OECD countries*". However, these provisions in Agenda 21 and in the OECD guidelines are non-binding and probably only rarely a point of reference for TNCs. In fact, it is doubtful that such non-binding provisions have any direct impact on corporate strategy. At best, TNCs will observe these guidelines because they express the international community's expectations to appropriate corporate conduct and thus indicate the direction of future more binding regulation (Rugman and Verbeke, 1998).

ii. Home country environmental regulation

While there are few international regulations and provisions directly targeted the environmental conduct of TNCs, TNC home countries may have measures in place to address the foreign environmental practices of their TNCs. Such provisions are however exceptionally rare¹³, something that is attributable to the fact that they would be likely to collide with obligations to the GATT¹⁴, to other trade agreements and to bilateral investment agreements. In the US, it has been proposed that US environmental standards should pertain to US production facilities abroad¹⁵, most recently in connection with the NAFTA negotiations. While no legislative action in this regard has succeeded, the judicial system has established that US companies can be held liable for accidents at non-US production facilities at US courts (Buckley 1993; 139)¹⁶. A more soft home country approach to control of foreign investors exists in certain European countries, where listed companies are required to report on foreign subsidiaries' environmental performance as part of their financial statement.

A special case is environmental conditionalities set by state sponsored investment promotion agencies. For instance, the Danish investment fund IFU (the Industrialization Fund for Developing Countries), which is funded by Danish development assistance, requires partners to observe certain environmental and ethical standards in their projects. These standards are consolidated in the fund's Environmental Guidelines and Human Rights

on revising the Guidelines, including its environmental provisions.

¹³ Some of the better known examples of extraterritorial provisions for foreign investors are from the US. In the 1970s, the US adopted the so-called Foreign Corrupt Practices Act, which was aimed at bringing the extra-territorial activities of US firms under domestic control in cases of corruption. More recently, the Helms-Burton Act has prohibited US investment in Cuba and also imposed sanctions on foreign affiliates of US companies dealing with Cuba. However, there are no examples of provisions focusing on the environmental conduct of investors.

¹⁴GATT generally prohibits extraterritorial application of standards and related to this, prohibits process standards for imported goods. The TRIM and TRIP agreements within the GATT framework furthermore restricts the scope for unilateral regulation of foreign investors.

¹⁵ See e.g. Neff et al, 1990 for such proposals.

¹⁶ See e.g. UNCTAD 1993c for an account of various measures that can be taken by home countries to impose cross border environmental liability.

Guidelines. As more than 50% of all Danish FDI projects in developing countries have the participation of this fund (Hansen, 1996), these guidelines may have a significant impact on the environmental performance of Danish TNCs.

iii. Host country regulation

While statutory standards exist in most developing countries, their implementation is frequently weak (Hadlock, 1994, Gladwin, 1987). The widespread implementation problems in developing countries are caused by lack of financial resources, trained personnel and equipment; embryonic environmental infrastructures; and problems of coordination between different jurisdictions¹⁷. Given these conditions, foreign investors will, like local operators, have an incentive to exploit the nominal or de facto differences in environmental regulation to obtain savings. TNCs may even be better positioned to exploit weak regulation than local companies due to their greater bargaining power vis-à-vis host governments (Gladwin, 1987; 11).

However, there are also factors related to host country regulation that may encourage TNCs to observe higher standards in developing host countries. One such factor is that foreign investors frequently are subject to tougher enforcement than local industry. This is partly because TNCs are the most visible foreign intrusion in any country and thus easily become subject to controversy when debates over environmental degradation fire up. "*A host government under public pressure to do something about industrial pollution is likely to clamp down first on foreign industry*" (Pimenta, 1987). It is also because TNCs often are operating in environmentally sensitive industries such as infrastructure development or natural resource extraction, activities that for obvious reasons expose them to intensified regulatory scrutiny. Moreover, TNCs may be subject to greater regulatory oversight because they, contrary to local companies, are perceived to possess the financial, technological and organizational means to improve environmental performance. Finally, some host governments, e.g. China, has separate environmental provisions for foreign investors, for instance in regard to environmental impact assessments (Gouming et al, 1999).

A second factor that may induce TNCs to operate with high standards regardless of the actual implemented standards in the host country is of a more strategic nature. TNCs may anticipate more stringent host country standards and enforcement in the future, and seek to avoid the relative high costs of retrofitting by implementing state-of-the-art technologies from the outstart. A survey from the late seventies of 86 German corporations with operations in developing countries revealed that only 16% of the TNCs used different technologies in their developing country operations. The study suggested that the decisive factor behind the standardized use of technology

¹⁷ See e.g. Jha (1998) for a description of implementation problems in India, Rasiah (1999) for Malaysia or Gouming et al (1999) for China.

was "*expectations of future environmental standards in host countries, and not only present standards*" (Knoedgen, 1979). Furthermore, by adopting the highest international standards in developing host countries, TNCs may shield themselves against arbitrary interventions and rent seeking behavior of local regulators (Hansen, 1998).

It is sometimes forgotten that although environmental regulation matters for environmental performance of firms, economic regulation may play an equally important role. In the case of TNC affiliates in developing countries, it may be particularly relevant to examine the impact of FDI legislation on their environmental performance. For instance, local content requirements, export and import requirements, joint ownership requirements, or currency limitations may constrain the options available for improving environmental performance. In line with this, a study of three US TNCs with affiliates in Asia found that developing countries' technology and siting requirements were major obstacles to the implementation of an optimal pollution control (Brown et al, 1993). Generally, FDI regulation may induce the TNC to adopt host country business practices: Much of the FDI regulation in developing countries is established to encourage TNCs to become embedded in the local business environment thereby enhancing diffusion of technology and know how. Becoming highly localized in terms of production set up, output and management systems is the price that a TNC may have to pay to get market access. However, local adaptation of the business set up may have consequences for environmental management practice. Thus, it can be hypothesized that the more embedded in the local business environment a TNC affiliate becomes, the more likely it is to adopt environmental management practices and procedures akin to those of local corporations.

iv. Summary

There are no or very few international and extraterritorial binding regulations requiring a particular conduct of TNCs in host countries. While developing host country environmental standards may be approaching those of most TNC host countries, the deficiencies of enforcement and infrastructure evident in many developing countries will in the short run provide a strong incentive for TNCs as well as non-TNCs to ease environmental standards and controls. In the longer run however, foresighted companies will anticipate future international standards and more stringent standards in developing host countries and implement state-of-the-art environmental systems to avoid costly retrofitting at a later stage. Moreover, it was noted that local adaptation of environmental practices may be facilitated by restrictive FDI regulation that in some instances inhibits the transfer of cleaner technologies and management practice.

b. Market forces

Conventional economic reasoning has it that market forces will reward those companies that can produce at the lowest cost and offer the most

competitive price at a given level of quality. This line of reasoning leads to a prediction that market forces in the longer run will reward those companies that have the lowest environmental costs. In the case of TNCs, this implies that the companies that best can exploit environmental advantages of the various locations in which they operate will be more profitable. Thus, the expectation will be that companies will opt for local adaptation in order to enhance competitiveness. However, in recent years some business economists have argued that market forces may bring about favorable environmental outcomes under certain conditions (BCSD, 1992, Porter et al, 1995). These conditions are partly related to the emerging 'green markets', partly to the quality orientation of the value chain.

i. Green markets

It has been argued that markets increasingly valuing environmental favorable behavior may reward high environmental performance. But is this also the case in regard to environmental performance in international operations? To answer this question, it is important to distinguish between different types of markets. Here, three types of markets will be discussed, namely consumer and spot markets, markets controlled by large customers, and financial markets.

In consumer and spot markets, companies are dealing directly with largely anonymous customers. The fragmentation and anonymity of these markets make them less likely to exert significant pressures on TNC cross border environmental performance. True, the business and environment literature is burgeoning with optimistic accounts of the effects of green consumerism on corporate behavior and it is also evident that high environmental product quality may yield a premium, especially in industries such as textiles and food. There are even cases where consumers are taking an interest in the way that products have been produced internationally, as indicated with the success of Max Havelar coffee, Body Shop products or 'green' cotton' textiles. However, these cases are rare exceptions. Generally, consumer's power in regard to monitoring the international environmental performance of TNCs is highly restrained by information problems and there is little room for consumers to make an informed assessment of the way a product has been produced in foreign locations, except in cases where credible certification and labeling have been established. The effect of consumer markets on corporate behavior is probably more of a defensive nature: An environmental scandal at a foreign affiliate may prompt a consumer backlash worldwide and severely restrict future operations for a TNC with a global presence. This threat may provide a strong incentive for TNCs to operate with high environmental standards regardless of location. Especially TNCs in industries with highly dangerous and polluting productions and/or TNCs based in countries with strong consumer movements will be vulnerable to such consumer backlash.

A more consistent and powerful market signal in regard to TNC environmental performance may come from large customers operating

downstream, be they large retail chains, large corporate customers or governments. These customers may be positioned to evaluate the environmental quality of production and exert pressure on the performance of their business partners¹⁸. Moreover, TNCs working as contractors for government agencies such as telecommunication or mining, will be more likely to be awarded contracts if they have documented environmental management systems in place (Clark, 1993). Thus, pressures from customers operating downstream may significantly encourage TNCs to improve environmental performance. Also incentives and pressures from companies operating upstream may influence TNC environmental conduct: For instance, companies with product stewardship programmes may induce buyers to observe certain standards in the handling and use of their products. A special case of upstream incentives and pressures relates to the role of companies delivering production equipment and turn key projects: In a study of clean practices in the paper and pulp industry Lundan (1996) identifies a series of push factors that may have encouraged the 'flight' of clean technology in the Swedish and Finnish paper and pulp industry and one of the factors cited is pressure from the machine manufactures "*who seek to recoup the development costs of the latest technology*".

Seen from the perspective of a TNC affiliate in a developing country, the environmental concerns on the market that it serves may be pivotal to its environmental practices. Is the affiliate servicing markets with a high environmental consciousness through exports, it may be more or less forced to adopt the environmental standards of the export market regardless of local requirements. In some cases, documented environmental management systems may even be a precondition for accessing the export market. Is the TNC affiliate on the other hand servicing a market with only limited environmental awareness, it is less likely that the company adopts cross border environmental management procedures and operate with high standards. In this case the company can be expected to adapt to local environmental requirements.

A third market factor that increasingly may affect TNC cross border environmental conduct is financial markets. A growing number of institutional investors are screening their investment ethically and environmentally¹⁹. A company not meeting expectations of institutional investors in regard to environmental or ethical dimensions may experience a squeeze on raising capital in the market. This factor may be particularly important for SME TNCs, as they will be comparatively dependent on their ability to raise capital in financial markets when starting up new projects. Evidence from Denmark suggests that the participation of the FDI promotion agency IFU may have played an important role in bringing environmental concerns into the agenda

¹⁸ Manufactures such as Sony, Volvo and Rebook or large retail chains such as IKEA, FDB or Walmart are well known for their environmental supply chain management.

¹⁹ Examples are for instance banks (e.g. the Bank of America), pension funds (e.g. PFA) or ethical investor coalitions (e.g. CERES).

of Danish SME foreign investors (Hansen, 1998). In recent years, the international community and several OECD governments have established funds to facilitate environmentally benign investment in developing countries, and national aid programmes have increasingly become earmarked support of investor's environmental performance (see e.g. Eriksen and Hansen, 1999 for such examples from Denmark). The abundance of such funds may create a significant incentive for TNCs to develop state-of-the-art environmental practices in developing countries.

ii. Just in time delivery and quality orientation

While much focus traditionally has been devoted the role of green sentiments in the market, it is probable that markets are more likely to encourage environmentally favorable behavior in TNCs as an incidental outcome of a strong quality and just-in-time orientation than as a consequence of a conscious effort by environmentally concerned consumers, customers and financiers. Thus, a focus on quality and timely delivery and a focus on environmental improvements may be two closely related objectives. Michael Porter has argued that many aspects of a quality orientation may actually save resources, make production more lean and reduce waste thus improving environmental performance (Porter et al, 1995) and it can be hypothesized that industries with a strong quality orientation can adopt environmental management relatively more easily than can industries without²⁰. In line with this, Clark (1993) suggests - based on a study of environmental practices in Australian mining TNCs - that quality and reliability in terms of delivery are heavily dependent on the technological and managerial sophistication of production and that high environmental performance is an essential ingredient in such technological and managerial sophistication. Conversely, Clark argues that close price competition and lack of quality focus in a market may encourage companies to ignore environmental dimensions.

Also in relation to non-controlled foreign partners, a quality-oriented market may have consequences for environmental practices. It can be hypothesized that with the growing interdependence of firms in integrated production networks and the subsequent growing vulnerability to disruptions due to production stops, consumer backlash or quality breaks in any part of the network, the organizers of the network - frequently large TNCs - will have an incentive to carefully screen, evaluate and either abandon or upgrade prospective partner's environmental performance within the limits set by propriety concerns and resources.

iii. Summary

From a conventional economic perspective, one might expect that market forces would encourage an environmental 'race to the bottom' in the sense

²⁰ Something that is further facilitated by the close structural affiliation of the ISO 9000 and 14000 series.

that the firms capable of operating with the lowest environmental costs would gain increasing market shares. But markets may also encourage environmental responsiveness in firms, including environmental responsiveness in international production. Thus, the more fragmented consumer and spot markets may in some instances encourage environmental responsiveness in international operations. More importantly it seems, are the pressures from financial markets and markets controlled by major customers. These markets may exert a significant influence on cross border environmental practices due to the greater bargaining power of the major players in this market. Finally, the quality orientation of the market may encourage improved environmental performance because high environmental performance may be a vital ingredient in any market with a strong quality and just-in-time focus.

c. Industry forces

A third category of forces potentially affecting the scope and content of cross border environmental management practices is related to the industry in which a given TNC operates. Thus, an industry's level of concentration and collaboration may significantly affect the environmental performance - including the cross border performance - of its firms. Let us examine some of the more important such industry forces:

i. The level of industry concentration and collaboration

The level of collaboration, concentration and collusion in an industry may have consequences for the scope and content of cross border environmental practices. Compared to the above discussed market forces, such industry forces will frequently be of a non-market nature, in that they are associated with the suspension of the market rather than the workings of the market. Under highly competitive market conditions, it will be difficult for individual companies to command a control over prices and thereby off set environmental investment. In such industries, it is probable that companies will compete on environmental laxity (Murphy and Oye, 1998) and in the case of cross border environmental management, opt for local adaptation. Conversely, in industries with few dominating firms having a high degree of market control - oligopolistic industries - industry may implement high standards worldwide and support the international harmonization of environmental regulations at a high level, partly because they are positioned to off set the costs of meeting these standards by raising prices, partly because high environmental industry standards may create a significant barrier to entry for new comers to the industry²¹. It can thus be hypothesized that state-of-the-art cross border practices are more likely to be found in concentrated industries with a few dominating firms than in fragmented industries with many small firms.

²¹ Environmentally 'benign' behavior by TNCs in highly concentrated industries may thus come at significant cost for consumers, a fact that is often overlooked.

Sometimes industry collaborates to create environmental associations and issue guidelines for members of industry. Frequently, this collaboration will focus on environmental dimensions of international production. Such collaboration can - in line with the collusion argument above - be seen as attempts to restrict market entry for new comers, especially new comers from developing countries. It can also be interpreted as attempts to deflect more binding regulation initiated by governments (Gleckman, 1992). But the motives could also be more benign, for instance that they are attempts to ensure that industry is in alliance with social expectations of society thus enhancing the industry's credibility and legitimacy. Furthermore, the establishment of environmental industry associations can be the result of a need among environmental professionals in an industry to have fora to discuss their particular managerial challenges²², and the formulation of guidelines can reflect an industry's need for benchmarks and standards that can be utilized to organize environmental activities and evaluate environmental performance.

Regardless of the motives behind such industry collaboration, recent years have seen the emergence of numerous green business networks or *green keiretzus* promoting environmental responsiveness among their members²³ and the number of industry initiated guidelines have proliferated (Tomorrow, 1994). The most well known initiative is probably the chemical industry's Responsible Care Program, which has played a significant role in shaping this industry's environmental orientation. Some of the industry guidelines contain provisions for the cross border conduct of TNCs: For instance, the ICC Business Charter for Sustainable Development, requires signatories to "*apply the same set of criteria regardless of location*" and the Japanese industry association Keidanren's Global Environment Charter requires members to "*make environmental protection a priority at overseas sites*" and to "*apply Japanese standards concerning the management of harmful substances*". Interestingly, a recent proposal for a revised EMAS standard, stipulates that companies must report on the environmental performance of their subsidiaries.

ii. Summary

The basic characteristics of an industry may fundamentally shape the nature of cross border environmental practices among its members. Thus, the level of concentration in an industry may be central to explain cross border environmental practices; in concentrated industries, firms will be better positioned to off set environmental costs and close industry collaboration on establishing high international environmental standards will be more likely. The motives behind industry collaboration can be legitimate, but the possibility that such collaboration takes place in order to close markets cannot be excluded.

²² Information regarding environmental dimensions will often be less sensitive from a propriety perspective and is therefor more freely disseminated across firm boundaries, through bilateral exchanges, through professional magazines or through conferences.

²³ See Tomorrow, 1994, UNCTAD, 1996, or Goldenman, 1999 for surveys of the proliferation of environmental business networks and guidelines.

Regardless of motives, recent years have seen a notable TNC involvement in the establishment of environmental industry associations and the development of guidelines, codes of conduct and standards. This collaboration has, among other things, resulted in various initiatives aimed at improving TNC cross border environmental management and performance.

d. Company specific forces

The above explanations on cross border environmental management practices focused on forces exogenous to the TNC. However, eventually the allocation of time, resources and technology to environmental measures in international operations rest on a decision of the company. Thus, the regulatory, market and industry forces discussed may essentially be seen as constraints and incentives on which companies forge their environmental management strategy. The perception of the strategic options available will vary significantly between companies, even among companies otherwise facing similar constraints and incentives. This section will examine those firm specific forces shaping the decision as to manage the environment across borders. We will focus on five factors, namely the nature of the firm's production technology, its environmental history in the home country, its size, its international management strategy, and the degree of ownership control it exerts over the foreign affiliate²⁴.

i. The nature of the production technology

Obviously, different firms face different environmental challenges depending on the nature of their activities and the nature of their production technology. The firms with high risks and/or potentially large environmental impacts can be expected to be strongly inclined to adopt cross border environmental practices. In line with this, the 1993 UNCTAD study of cross border environmental management in 169 of the world's largest TNCs (UNCTAD, 1993) found that the TNCs with the largest potential environmental problems – typically firms in the chemical and extractive industries - were significantly more inclined to adopt cross border environmental controls than were TNCs involved in low risk production. For a firm involved in high risk production, an accident at a foreign affiliate can be exceptionally damaging, not only for the foreign affiliate but for the whole corporation as demonstrated with the fate of Union Carbide in the wake of the Bhopal disaster²⁵.

ii. The environmental history from home countries

²⁴ Other company specific factors could be relevant, for instance management leadership or cultural factors.

²⁵ In the wake of the Bhopal disaster, Union Carbide, the owner of the production facility that caused the disaster, experienced a severe crises with hostile take over bids, and the company had major problems of finding locations for new production sites anywhere in the world (Gladwin, 1987b).

According to conventional theories of FDI, TNCs invest in order to exploit ownership advantages that are not available in the host market (Dunning, 1988). As these advantages frequently are developed in countries with relatively tough environmental regulations, environmental cleanness may be build into the business set up and thus difficult to decouple. Consequently, companies may be 'inclined' to transfer state-of-the-art environmental technologies and processes simply as a consequence of the nature of its home country operations. As argued by one observer, *"fixed and sunk cost may make it cheaper to use environmentally friendly technologies that have been developed for domestic plants elsewhere than to redesign them for laxer standards"* (Raucher, 1997). In general, a given company's particular history and organization in the home country may significantly shape its cross border environmental management practices. This 'path dependence' is indicated by a 1993 study by UNCTAD (UNCTAD, 1993) where a strong correlation between TNC's cross border practices and their home country was detected.

iii. The size and international orientation of the TNC

Obviously, there will be a correlation between the nature of cross border environmental management practices and the size of the company in question. The largest TNCs can more easily offset the cost of environmental investment and obtain scale advantages. Conversely, in SME TNCs, a formalized cross border environmental management system is less likely to be found; even financial and quality reporting and control may in SME TNCs take place in a highly informal manner. Consistent with this, the 1993 survey by UNCTAD found a very strong correlation between size of TNCs measured in terms of annual sales and the scope and content of cross border environmental management practices.

However, according to Hansen (1998) an even stronger explanatory factor than size is the international orientation of a company. A company with presence in many different locations can obtain scale advantages by devising a uniform management system and adopting standards worldwide that meet the highest requirements internationally. While only less than 20 percent of 112 Danish companies with operations in emerging economies had formalized cross border environmental controls, this number was almost 3/4 for companies with more than 20 foreign affiliates. In line with this finding, Royston in his study of TNCs in a range of developing nations concluded that the *"technical standards of the plants operated by multinationals in different countries tend to be similar, just because it is managerial simpler to standardize"* (Royston, 1979). Hadlock (1994) further explains this correlation between multinationality and environmental practices by arguing that it would be impractical to design separate training curricula, personnel evaluation systems, audit and inspection protocols, risk reduction initiatives and standard environmental procedures for operations in distinct plants or countries. Finally, Murphy and Oye (1998), argue that companies having huge assets embedded in international operations ('high multinational asset specificity') – typically companies with numerous foreign affiliates and/or large foreign sales - will be more vulnerable

to disruptions of production in foreign locations and therefore more inclined to seek harmonization of environmental standards across borders.

iv. International strategy and organization

The cross border environmental strategy of a TNC can be hypothesized to reflect its overall international management strategy and organization. Thus, the level of cross border integration of environmental management may in large measure depend on whether the TNC is pursuing a stand alone or globally integrated strategy. A TNC having a highly integrated international organization, where most functions are managed mainly from headquarters, is also more likely to have a closely integrated environmental management system and conversely, a company that pursues a stand alone strategy will be more likely to have a locally adapted environmental management system with few cross border links. However, it is conceivable that the same firm may opt for integration of some functions while for local adaptation of others. This mixed strategy is in the literature referred to as 'glocalization' (Kobrin, 1988). An interesting special case in this regard is where globalizing pulls of environmental management are so distinct and strong that they can provoke an integrated environmental management system in an otherwise localized production.

v. Ownership

The discussion hitherto has focused on companies that has 100% ownership of the foreign venture. However, TNC control with foreign operations may vary from no equity participation (strategic alliances, licensing, turnkey operations, franchising or subcontracting) to 100% equity participation. Obviously the level of equity plays a decisive role in determining the TNC's ability to influence and control environmental activities of the affiliate. In the case of non-equity arrangements, it is probable that little direct control can be exercised, with the possible exception of cases where the TNC has market dominance or where a highly interdependent network relationship exists. Also in cases where the TNC enters with small minority shares ²⁶ it is unlikely that significant influence on environmental dimensions can be exercised. In the case of joint ventures with foreign investor majority, the options for control over environmental performance are greater. In principle, the majority owner can determine the course of investments and priorities, including those related to the environment. However, also in this case there may be limits to the majority owner's ability to control. For instance, the minority partner may not be willing to increase share capital to accommodate environmental investments, thus leaving the majority owner with the option of either financing the investment alone or give it up.

²⁶ For instance in connection with turn key operations where the purpose of equity participation is to ensure credibility or to contribute to the financial package of the project.

Table 2: Forces of fragmentation and integration

	Reasons for local adaptation and fragmentation of environmental management	Reasons for cross border integration of environmental management
Regulatory forces	<ul style="list-style-type: none"> • Absence of regulatory standards • Weak enforcement of regulation • Absence of environmental infrastructures • Restrictive FDI regulation 	<ul style="list-style-type: none"> • Building trust with host country regulators • Anticipation of future host country and international regulations • Creating first mover advantages • Fencing off rent seeking regulators
Market forces	<ul style="list-style-type: none"> • Weak environmental screening by other market agents • High level of price competition • Low quality orientation 	<ul style="list-style-type: none"> • Green consumerism • Potential consumer backlash • Environmental screening by major customers and financial institutions • High quality orientation • Export to environmentally leading markets
Industry forces	<ul style="list-style-type: none"> • Fragmented industry with many small firms • Weak intra-industry collaboration 	<ul style="list-style-type: none"> • Concentrated industry with few dominating firms • Strong industry collaboration on the environment • Strong professional cultures of excellence within industry
Company specific forces	<ul style="list-style-type: none"> • Low environmental risks • Little previous experience with international production • Low multinational asset specificity • Stand alone operations • Small owner share 	<ul style="list-style-type: none"> • Environmental high risk production technology • Long experience with international production • Large sunk costs in the development of cleaner technology and management practice • High multinational asset specificity • Global management strategy • Majority ownership

vi. Summary

While external pressures and incentives are important to understand the scope and content of cross border practices in TNCs, the influence of these forces will eventually depend on company specific characteristics. Obviously, the history of the particular TNC matters: Rather than acting upon future

opportunities or perceived constraints, a company will tend to follow already known paths in foreign locations, for instance by devising environmental management systems similar to those of its home country. A contributing factor is that it may be difficult for the company to externalize environmental protection measures that are already internalized in the production set up. The size of the TNC may influence cross border environmental practice; however the level of internationalization of a company may be even more important. Finally, the level of formal control with a given affiliate is likely to be a central factor for explaining cross border environmental management; minority ownership may in most cases make cross border environmental management practices difficult to establish and implement.

IV. Conclusion and avenues for future research

This paper sought to pin point the particular function within companies that deals with the management of environmental dimensions of foreign operations. This function was labeled 'cross border environmental management'. To gain a better understanding of the nature of cross border environmental management practices in TNCs, is vital in a policy perspective: Cross border environmental management may be one of the key elements in addressing environmental concerns related to international production. One of the advantages of conceptualizing the discussion of foreign investor environmental responsibility around this concept is that cross border environmental management is a generic function that applies to all firms and is therefore a feasible tool to use both for TNCs and regulators.

The paper started out by assessing the content and state of cross border environmental management. It was argued that a cross border environmental management system typically has five elements, namely general principles, standards and objectives for international conduct; worldwide policies and programmes; control and reporting procedures and methodologies for foreign operations; training and education activities; and an organizational set up. A cross border environmental management system can contain one or more of these elements and it can be more or less formalized. A typology of cross border environmental management practice was offered where four different types of cross border environmental management was distinguished based on the level of cross border integration of the affiliate environmental management function.

Based on a review of the relatively few existing studies in the field, it was argued that cross border environmental management is an emerging discipline within environmental management and that many transnational corporations have adopted such practices. On the other hand, there is also evidence that some TNCs have not yet adopted cross border environmental practices and instead opt for local adaptation of their environmental management set up. *More research is however needed to arrive at firm conclusions in regard to the content and state of cross border environmental management. In particular*

there is a pertinent need to understand, what proportion of TNCs are adopting cross border environmental practices; to identify state-of-the-art cross border environmental practices that can be used as benchmarks for other companies; and to evaluate how and to what extent TNCs are expanding their cross border practices to include non-controlled affiliates and suppliers. Moreover, as a growing proportion of FDI is carried by SME TNCs and TNCs from non-OECD countries, there is a pertinent need to understand the state and content of cross border environmental practices in such TNCs.

While there definitely is a need for more research on the state and content of cross border environmental management, it is probably safe to conclude that TNCs are both 'boon and bane' in regard to environmental management of foreign affiliates. This raises the question of, under which conditions TNCs produce favorable environmental responses and under which they do not? This question was addressed in the second part of the paper. As with any aspect of TNC practices and strategies, environmental management is basically poised in a conflict between localizing and globalizing forces: There are economic and political advantages associated with adapting to the local culture, regulatory system, and market structure etc. But on the other hand there are also advantages associated with linking up to, and becoming integrated in, the transnational network. The paper offered a framework for analyzing the forces pushing the environmental management function toward global integration and local adaptation respectively. It was argued that cross border environmental management is determined by various company specific forces and a series of contextual forces. To understand the dynamics of cross border environmental management thus requires not only a focus on company strategy in relation to company specific configurations but also an understanding of the overall market, industry and regulatory configurations that shape the degree of local adaptation and global integration.

Generally, the literature has been preoccupied with the forces driving companies toward local adaptation and fragmentation in regard to environmental management in developing countries. And it is also true that if focus is exclusively on current environmental regulation in developing host countries, there is a strong case for expecting fragmentation, local adaptation and 'double standards'. However, the paper demonstrated that there also are good economic and organizational reasons, why companies may benefit from integrating the environmental management function regardless of host country regulatory requirements: By standardizing environmental management systems and technologies across borders the TNC may gain scale advantages and recoup sunk costs; by replacing deficient markets for environmental services and monitoring, TNCs may develop assets that can be exploited in the market; and by devising cross border environmental management practices, TNCs may obtain first mover advantages as environmental regulation is strengthened in developing host countries. In short, cross border environmental management practices may under certain conditions contribute

to enhancing company's competitiveness²⁷. *A major challenge for future research on this issue must therefore be to examine, why and when TNCs adopt cross border environmental practices and under which conditions TNC competitiveness and environmental responsiveness in international operations are mutually supportive.*

As a final caveat, it should be noted that the premise of this paper has been that TNCs, qua being involved in international production, operate under configurations different from those of non-TNCs and that this fact significantly affects their environmental performance. Thus, the paper identified a host of TNC specific forces presumably affecting cross border environmental conduct; to mention a few, being part of a multinational network providing scale advantages; having stakeholders not only in the host country but also in the home country; being under greater scrutiny in the host country than non-TNCs; or having low cost access to clean technologies and environmental management know-how developed in OECD countries. However, whether these TNC specific forces are decisive in regard to TNC environmental performance when compared to forces affecting non-TNCs and TNCs alike, is an open question. *Thus a major challenge for future research will be to evaluate the environmental significance of forces associated with multinationality vis-a-vis forces affecting TNCs and non-TNCs alike.*

²⁷ While it is dangerous to generalize across industries and sectors, there seems to be evidence that TNCs with extensive cross border procedures are no less profitable or competitive than companies without such procedures. As noted by Gentry (1999;13), the top ten companies in the 'World Competitiveness Rankings' all have elaborate environmental programs in place (IMD, 1998) and a study found that TNCs adhering to high environmental standards in all economies including emerging markets, have higher market values than their competitors (Dowell, Hart, Yeung, 1998).

List of references

- Bartlett, C.A., and Ghoshal, S., Managing across borders, London: Century Business, 1989.
- BCSD (The Business Council for Sustainable Development). Changing Course. A Global Business Perspective on Development and the Environment. MIT Press. Mass, 1992.
- Birdsal and Wheeler, "Trade Policy and Industrial Pollution in Latin America: Where are the Pollution Havens?", in Low, P., International Trade and the Environment, Washington: World Bank Discussion Papers, 1992.
- Blackman, A. and Wu, X. Foreign Direct Investment in China's Power Sector: Trends, Benefits, and Barriers, Discussion Paper 98-50, Washington D.C., Resources for the Future, September, 1998.
- Bowonder, B., "The Bhopal Accident", Technological Forecasting and Social Change, 32, pp. 169-182, 1987.
- Brown, H. et al., Corporate Environmentalism in a Global Economy: Societal values in international technology transfer. Conn.: Quorum Books, 1993.
- Castleman, B.I., "The Double Standard in Industrial Hazards", in Jane Ives (ed), The Export of Hazard: Transnational Corporations and Environmental Control Issues, Boston:Routledge and Kegan Paul, 1985.
- Chang Xing, Di, The environmental performance of european transnational corporations, Ph.D. Thesis, Beijing, China, 1995.
- Clark, G., "Global Competition and the Environmental Performance of Australian Mineral Companies. Is the "Race to the Bottom" inevitable?" International Environmental Affairs no.3, pp. 147 -172, 1993.
- Dasgupta, S., Hettige, H., and Wheeler, D., What improves environmental performance? Evidence from the Mexican industry, Policy Research Working Paper 1877, Washington DC: World Bank, 1998.
- Dean, J.M., "Trade and the Environment: A Survey of the Literature", Low, P., International Trade and the Environment, Washington: World Bank Discussion Papers, 1992.
- Deloitte & Touche. The Environmental Transformation of US industry: A Survey of US Multinational Corporations Environmental Strategies, Management Policies and Perceptions. Stanford: Stanford University Graduate School of Business Public Management Program, 1990.
- Dowell, G., S.Hart, and B. Yeung, "Do corporate global environmental standards create or destroy market value", draft, August 1998.

- Dunning, J.H., Alliance Capitalism and Global Business, London: Routledge, 1997
- Dunning, J.H., "The eclectic paradigm of international production", Journal of International Business Studies, XIX, 1-31, 1988c.
- Dunning, J.H., The Globalization of Business, London: Routledge, 1993.
- Eriksen, J., and M.W.Hansen, Environmental aspects of Danish direct investment in developing countries: Managing the environment in an open economy, Occasional paper no. 2, Cross border environmental management project, CPH: Copenhagen Business School, 1999.
- ESCAP (Economic and Social Commission for Asia and the Pacific) and UNCTC (United Nations Centre on TNCs), Transnational corporations and environmental management in selected Asian and Pacific developing countries, Bangkok:United Nations, 1988.
- Eskeland, G. and Harrison, A. Moving to Greener Pastures? Multinationals and The Pollution Haven Hypothesis, World Bank, Public Economics Division, Policy Research Department, January, 1997.
- Friedman, F.B. Practical Guide to Environmental Management.. Washington. D.C.: Environmental Law Institute, 1988.
- Gentry, B., FDI and the environment: Boon or bane?, Paper presented to OECD conference on foreign direct investment and the environment, 28-29 January 1999, Paris: OECD, 1999.
- Gentry, B., Private capital flows and the environment, Mass: Edward Elgar Publishing, 1998.
- Gladwin, T. "Environment and Development and Multinational Enterprises", in C. Pearson, ed., Multinational Corporations, Environment and the Third World., Duke University Press, 1987.
- Gladwin, T., "A case study of the Bhopal Tragedy", in C. Pearson, ed., Multinational Corporations, Environment and the Third World., Duke University Press, 1987b.
- Gleckman,H., Transnational Corporations and Sustainable Development: Reflections from inside the debate, Internal memo from DESD, 1992.
- Goldenman, G., The environmental implications of FDI: Policy and institutional issues, Paper presented to OECD conference on foreign direct investment and the environment, 28-29 January 1999, Paris: OECD, 1999.
- Guoming et al, Cross border environmental management and transnational corporations: The case of China, Copenhagen: UNCTAD/CBS Occasional Paper Series no 3, 1999.
- Hadlock, C.R., Multinational Corporations and the Transfer of Environmental

- Technology to Developing Countries, in International Environmental Affairs, Vol 6, no 2, 1994.
- Hansen, M.W., A..Ruud, "Managing the environment across borders", Paper presented to the American Academy of Management Annual Meeting in Cincinnati, November, 1996.
- Hansen, M.W., Danish Foreign Direct Investment in Less Developed Countries and Eastern Europe: A Survey of the International Operations of Danish Companies, Working Paper, Copenhagen:CBS, 1996.
- Hansen, M.W., Transnational corporations in sustainable development: An appraisal of the environmental implications of FDI in developing countries, CPH: CBS, 1998.
- Hansen, M & A.Ruud. Transnational Corporate Environmental Management Strategy. A portrayal. Working Paper, Centre for Development and the Environment. University of Oslo, 1995.
- Hartman, R.S. Huq, M. and Wheeler, D. Why Paper Mills Clean Up: Determinants of Pollution Abatement in Four Asian Countries, World Bank, New Ideas in Pollution Regulation, No 1710, Washington: World Bank, 1995.
- Huq M. and Wheeler D. Pollution Reduction Without Formal Regulation: Evidence from Bangladesh, Working Paper no. 1993-39, Washington: World Bank, Environment Department (1993).
- IMD, World Competitiveness Yearbook: New Frontiers of Competitiveness, Geneva, 1998.
- International Labor Organization (ILO), Safety and Health Practices of Multinational Enterprises, Geneva:ILO, 1984.
- Ives, J.H. ed., The Export of Hazard. Transnational Corporations and Environmental Control Issues. London: Routledge and Kegan Paul, 1985.
- Jaffe et al, "Environmental Regulation and the Competitiveness of U.S. Manufacturing: What does the Evidence Tell Us?", Journal of Economic Literature, Vol XXXIII, pp 132-163, 1995.
- Jenkins, R., Trade, investment and industrial pollution: A Malaysia case study with some Mexican comparisons, IKMAS Working Paper, Malaysia;IKMAS, forthcoming 1999.
- Jha, Veena, Investment liberalization and environmental protection: Conflicts and compatibilities in the case of India, Occasional paper no. 1, Cross border environmental management project, CPH: Copenhagen Business School, 1998.
- Kasperson, J. and R. Kasperson, 'Corporate culture and the transfer of technology', in H.Brown, P. Derr, O. Renn, and A. White, Corporate Environmentalism in a Global Economy: Societal values in technology Transfer, Westport: Quorum Books, 1993.

- Knoedgen, Gabriele, "Environmental and Industrial Siting: Results of an empirical Survey of Investment by West German Industry in Developing Countries, Zeitschrift fur umweltpolitik 2, 1979.
- Kobrin, S.J., "Strategic integration in fragmented environments...", in N.Hood and J.E.Vahlne (ed), Strategies in Global Competition, London: Croom Helm, 1988.
- Kogut, B., "Designing global strategies", in Sloan Management review, Fall 1985.
- Leonard, H.J., Pollution and the Struggle for World Product: Multinational Corporations, Environment and International Comparative Advantage, Cambridge: Cambridge University Press, 1988.
- Lundan, S.M., Internationalization and environmental strategy in the pulp and paper industry, PhD. Thesis, Rutgers University, New York, 1996.
- McKinsey & Company. The corporate response to the environmental challenge. Amsterdam: McKinsey & Company, 1991.
- Murphy, Dale M. and Kenneth A. Oye, Comparative regulatory advantage: Firm state relations in the global economy, Paper presented at ISA Conference in Minneapolis, March 1998.
- Neff, A., "Not in their backyards, either: A proposal for a foreign environmental practices act", in Ecology Law Quarterly, vol.17, 1990.
- Pargal S. and Wheeler D. Informal Regulation of Industrial Pollution in Developing Countries: Evidence from Indonesia *Journal of Political Economy*, vol. 104, no. 6, pp. 1314-1327), 1996.
- Pearson, Charles S. Down to Business: Multinational Corporations, the Environment and Development. Washington D.C.: World Resources Institute, 1985.
- Pimenta, J.C., "Multinational corporations in industrial pollution control in Sao Paulo, Brazil", in Pearson, C. ed. , Multinational Corporations, Environment and the Third World , Duke: Duke University Press, 1987.
- Porter, M.E. and Claas van der Linde, "Green and Competitive", in Harvard Business Review, September-October 1995.
- Rappaport A. et al, Multinational Corporations and the Environment: A Survey of Global Practices. MA: The Center for Environmental Management, 1991.
- Rasiah, Rajah, Transnational corporations and the environment: The case of Malaysia, Occasional paper no. 4, Cross border environmental management project, CPH: Copenhagen Business School, 1999.
- Renn et al, "Doing the right thing in exporting hazardous technologies", Environment Science and Technology, 25:12, 1991.

- Roome, N., "Developing Environmental Management Systems" in Business Strategy and the Environment, 1(1): 11 - 24, 1992.
- Root, F.R., International Trade and Investment, Cincinnati: South Western Publishing, 1990.
- Royston, Michael B. "Local and multinational corporations....", Environment 27 (Jan /Feb): 12-20, og 39-43, 1985.
- Royston, M. G., "Control by Multinational Corporations: The Environmental Case for Scenario 4", Ambio 8, No. 2/3, 1979.
- Rugman, A.M. and Verbeke, A corporate strategy framework for the analysis of trade and the environment, Paper presented to AAM Conference, Autumn 1997.
- Ruud A., Corporate environmental decisionmaking. Working paper 2, Centre for Development and the Environment, University of Oslo, 1995.
- Steger, U., "The greening of the Board Room: How European Companies are Dealing with Environmental Issues". In Fischer, K. & J.Schot (eds.) Environmental Strategies for Industry. Washington D.C.: Island Press, 1993.
- Tomorrow, "In search of environmental excellence", Tomorrow, no.4, vol IV, 1994
- UNCTAD (United Nations Conference on Trade and Development), Environmental Management in Transnational Corporations, N.Y: United Nations, 1993.
- UNCTAD, Improving liability measures for addressing transfrontier pollution, Environment series No.4, Prepublication copy, New York: United Nations, 1993c.
- UNCTAD, International Environmental Law: Emerging Trends and implications for transnational corporations. New York: United Nations, 1993b.
- UNCTAD, Selfregulation of environmental management: An analysis of guidelines set by world industry associations for their member firms, Geneva: UNCTAD, 1996.
- UNCTAD, World Investment Report 1995: Transnational corporations and competetiveness, Geneva: The United Nations, 1995.
- UNCTAD, World Investment Report 1993: Transnational corporations and integrated international production, New York: The United Nations, 1993d.
- UNCTC, "Transnational corporations and the environment", UNCTC, World Investment Report 1992: TNCs as Engines of Growth, New York: The United Nations, 1992.
- UNIDO (United Nations Industrial Development Organization), "Industry and environment", in UNIDO, Industry and Development: Global Report 1991/92, Vienna UNIDO, 1991.

- Wallace, David, Sustainable industrialization, London: Earthscan, 1996.
- Walter, I., "Environmental management and the international economic order", in C. Bergstein, ed., The future of the international economic order, Massachusetts: Heath, 1973.
- Walter, I., International Economics of Pollution, London: Macmillan, 1975.
- Wescott, Environmental assistance: A quid pro quo for transnational corporations and developing countries, Spectrum paper, Massachusetts: Arthur D. Little, 1991.
- Westney, Eleanor D., Institutionalization theory and the multinational corporation, in Ghoshal and Westney (ed), Organization theory and the multinational corporation, St. Martin's Press, New York, 1993.
- Wheeler and Martin, "Prices, Policies and the International Diffusion of Clean Technology: The case of Wood Pulp Production", in Low, P., International Trade and the Environment, Washington: World Bank, 1992.
- Willums, J.O. & U, Golüke/International Chamber of Commerce 1992. From Ideas to Action. Business and Sustainable Development. The Greening of Enterprise, Oslo:Ad Notam, 1992.
- Zarsky, L., Havens, halos and spaghetti: Untangling the evidence about FDI and the environment, Paper presented to OECD conference on foreign direct investment and the environment, 28-29 January 1999, Paris: OECD, 1999.