

**The interface between foreign direct  
investment and the environment:  
The Case of China**

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## 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

This paper examines the role of foreign direct investment in China with particular focus on its implications for the environment. An overview of policies and practices in environment protection is presented; including a separate section devoted to the Chinese environmental regulatory framework regarding TNCs. The study shows that FDI generates both positive and negative effects on China's environment, but to identify the scale of such effects remains extremely difficult. As many FDI projects are located in the so-called pollution-intensive industries, the risk of environmental damage has increased. The authors argue that there seems to be greater environmental implications by FDI from the more developed countries in Asia than from developed countries. It is concluded that further examination at the firm-level is highly desirable to provide a solid basis for the Government to formulate effective policy measures. The authors suggest that such case studies focus on the investigation of the cross border environmental management systems within the TNCs' integrated production networks, as well as on the identification of the actual level of technologies employed.

***Please note that the views and opinions expressed in this paper reflects those of the authors and do not necessarily represent those of UNCTAD or CBS.***

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# The interface between foreign direct investment and the environment: the Case of China

By Xian Guoming, Zhang Cheng, Zhang Yangui, Ge Shunqi & James X. Zhan<sup>1</sup>

## I. Introduction

China is the largest developing country in the world, and the second largest recipient of foreign direct investment (FDI)<sup>2</sup>. Over the past two decades, China has achieved outstanding progress in economic development. FDI has been an engine of growth. It has contributed an average of 2.3 percentage points of the annual average GDP growth in the 1990s. As FDI stock reaches a significant level and the emphasis shifts from quantitative to qualitative FDI, one important issue is the impact of FDI on China's environment: Has China emerged as a "pollution haven" for TNCs? Is China better off or worse off with respect to its environment by hosting huge amounts of FDI? What environmental standards should be applied for TNCs operating in China? What is the proper role of the Government in maximizing the positive role of FDI and minimizing its negative effects?

This paper examines the role of FDI in China with particular focus on its implications for the environment. It reviews trends and policies of FDI in China and its significance for national economic development. It then presents an overview of policies and practices in environment protection; with a separate section devoted to the environmental regulatory framework regarding TNCs. The paper then examines the positive and negative impacts of TNCs on China's environment, and policy debates arising therefrom. The study concludes with some preliminary conclusions. Some issues are also raised for further research in a follow-up study on cross-border environmental management in individual foreign affiliates in China.

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<sup>1</sup> The paper was drafted by the first four professors at the Institute of International Economics of Nankai University, Tianjin, China; and was finalized, with substantive revisions and additional inputs, by James Xiaoning Zhan, Economist at UNCTAD. The authors are grateful to Michael Hansen of Copenhagen Business School and Khalil Hamdani of UNCTAD for their comments and suggestions.

<sup>2</sup> In this report, "foreign direct investment" and "foreign investors" are defined on the basis of custom border, i.e., investment flows across the custom boundary into the People's Republic of China. Investments from Hong Kong (SAR of China), Taiwan Province of China and Macao are considered as FDI, even though these areas are parts of China.

## **II. Foreign Direct Investment and China's Economic Development**

### **2.1 Trends in Foreign Direct Investment**

Since the economic reform and open-door policy of 1978, China has been extraordinarily successful in attracting FDI. By the end of 1998, China had approved over 324,700 FDI projects, with a contractual value of US\$ 572.5 billion. The accumulated actual inflows of FDI amounted to US\$ 267.5 billion. Over the past few years, China has been the second largest FDI recipient in the world, and the largest among the developing countries. Over 170 countries and regions, and 300 of the world's largest TNCs have establishments in China.

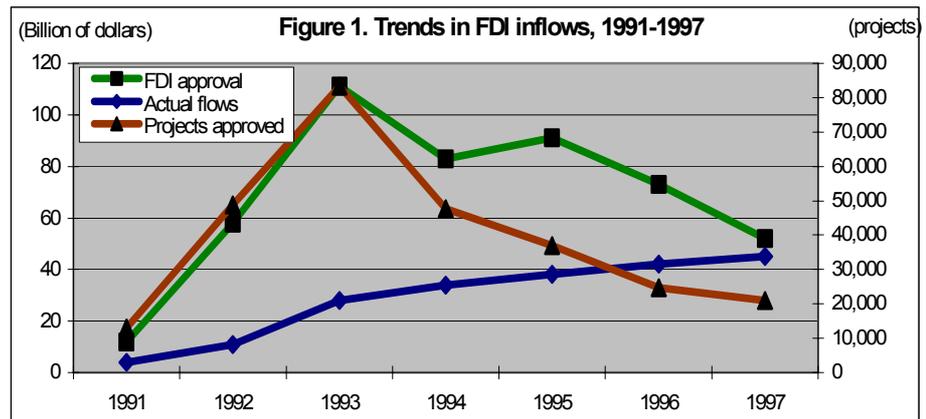
#### **2.1.1 Principal Stages**

In general, four distinct stages can be discerned:

*Experimental stage* (1979-1987). During the period, an institutional framework was developed, through trial and error, to facilitate FDI. The initial liberalization of the FDI regime was well received by potential investors. However, the overall trend of FDI commitments was irregular, reflecting changes in the economic environment and adjustments in macroeconomic policies. Flows of FDI were at a relatively low level, with an annual average of US\$1.2 billion.

*Growth stage* (1988-1991). The second stage was marked by an intensified promotion effort. This, coupled with a relatively comprehensive regulatory framework and an overall investment infrastructure built up in the first stage, made China attractive to foreign investors. Inflows of FDI grew steadily during this period. FDI reached US\$14 billion, with an annual average of US\$3.6 billion.

*Boom stage* (1992-1995). FDI inflows rose by 147 per cent between 1992 and 1993. After this great leap forward, inflows increased by another 17 per cent between 1994 and 1995. In absolute terms, inflows increased from US\$11 billion in 1992 to \$38 billion in 1995, almost equivalent to the average annual inflows of all developed countries put together in the first half of the 1980s. China became one of the largest host countries in the world. Other salient features include: a significant increase in average value of individual investment projects; more emphasis on the ownership control by foreign investors; large TNCs started to set up strategic footholds in the Chinese market. An accelerated process of reform and rapid liberalization of FDI regime, including new mode of entry such as BOT, were the main driving forces behind the boom of FDI inflows. In the meantime, outstanding economic performance (an average annual GDP growth of 12 per cent between 1991-1995) served as a catalyst in this respect.



Source: UNCTAD database on FDI/TNCs.

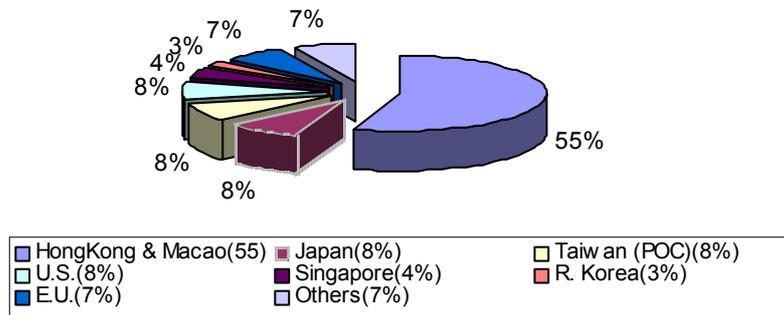
*Stage of adjustment and consolidation (1996-present).* During this period, FDI inflows remained at a remarkably high level, although the rate of growth slowed down, and the amount of FDI approvals declined considerably. The Government has made some important adjustments geared towards establishing a strong link between FDI and industrial policies. The emphasis has shifted from the quantity to the quality of FDI, targeting FDI in some key sectors. Screening and monitoring of FDI entry and operation have been strengthened. The number of new projects approved and the amount of contracted FDI are fewer than before, but the actual inflows remain at a high level. FDI in high-tech industries and in infrastructure has increased rapidly.

Looking ahead, FDI inflows may reach a peak soon, as a result of a number of factors, including cyclical effects and the Asian financial crisis. Nevertheless, there is good reason to believe that this would be mainly of a temporary nature. China will remain one of the top FDI destinations in the world.

### 2.1.2. Patterns of FDI in China

There are overall imbalances of FDI stock in terms of sources of FDI, sector distribution and regional location within China. Such imbalances were particularly striking in the 1980s, but have been reduced significantly over the past few years.

**Figure 2. FDI by source in China, stock as of 1997.**

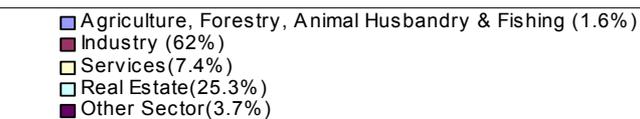
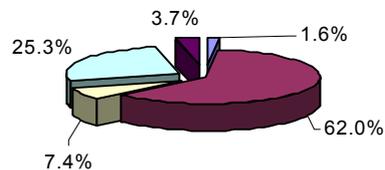


Source: James Zhan based on MOFTEC, China

*Sources of FDI.* The majority of FDI comes from developing Asia. Hong Kong (SAR, China) and Taiwan Province of China accounted for 62 per cent of total FDI stock in 1997, while FDI originating from the Triad, the dominant force behind outward FDI in the world made up only one-fifth of the total stock in China (see Figure 2). Recent years, however, witnessed an increasing share of FDI from the United States and Europe. In 1993, the share of FDI from the EU was only 2.4 per cent. It increased to 9.6 per cent in 1997. Nine out of the ten largest manufacturing TNCs in Germany have set up joint ventures in China. Some of them have even established several affiliates. For example, Hoechst has more than 10 subsidiaries, while BASF and Bayer have more than 5 each in China.

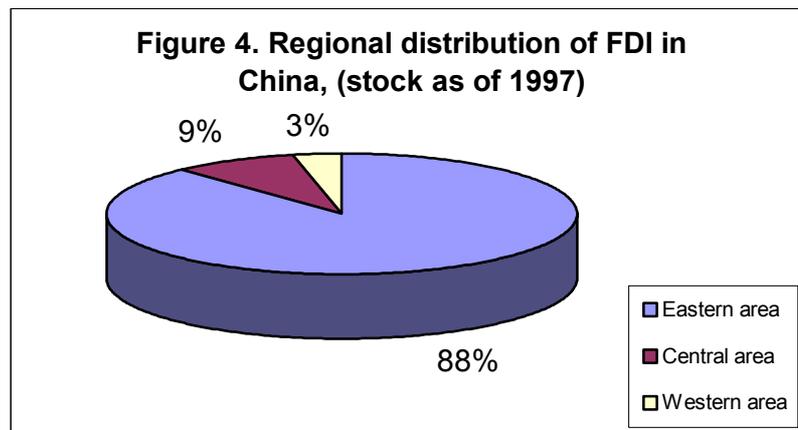
*Sectoral distribution of FDI.* The manufacturing sector has absorbed the lion's share of FDI in terms of stock, followed by real estate (see Figure 3). In recent years, however, the share of FDI inflows to the services sector has increased significantly, mainly due to the liberalization of that sector.

**Figure 3. FDI stock by sector, (contractual value as of 1997)**



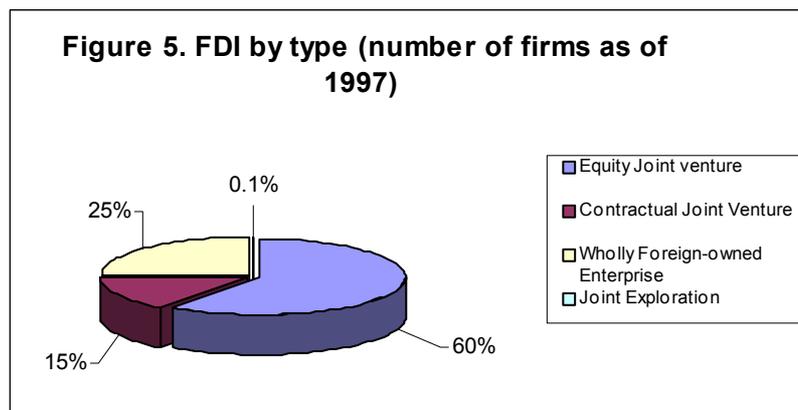
Source: James Zhan (1999), based on data from MOFTEC.

*Regional distribution of FDI.* The regional distribution of FDI is extremely unbalanced. FDI has been concentrated in the coastal areas in the eastern part of China (see Figure 4). This is mainly because of their superior locational advantages, on the one hand, and the preferential investment policy over the past years, on the other. The mid- and western parts of China have been largely neglected by foreign investors. Despite the Government's preferential policies and additional promotional measures adopted more recently, such imbalance is expected to persist for some time.



Source: MOFTEC, China.

*Types of ventures.* The majority of FDI is in the form of equity joint ventures, about 60 per cent (see Figure 5). However, the share of 100 per cent foreign-owned affiliates has been growing rapidly since the mid-1990s. More and more foreign investors prefer to have ownership control over their ventures.



Source: MOFTEC, China

As we shall see later, the type of ventures, and source of FDI, can be important for cross-border environmental management within foreign affiliates in China.

## **2.2. Regulatory Framework for Foreign Direct Investment**

The policy objective of the Government in attracting FDI is to enhance China's national strength and international competitiveness. The current regulatory framework has a strong linkage with national development strategies and industrial policies. Emphasis has been laid on the quality of FDI in terms of its contribution to growth and development of the national economy.

### **2.2.1. Guidelines for foreign direct investment**

In 1995, China promulgated "Interim Provisions for Guiding Foreign Investment" and "The Guiding List of Industries for Foreign Investors." Since then, the guidelines have been updated regularly reflecting the latest economic developments, policy re-orientations and priorities. In these official documents, FDI projects are broadly divided into 4 categories, i.e., those that are encouraged, permitted, restricted and prohibited. FDI is encouraged in new agro-technology and agricultural development, energy, telecommunications and essential raw-material industries. The "encouraged" category also includes projects using advanced technology to improve products and the production process, economical use of energy and raw materials, and the efficiency of domestic enterprises. It also encourages investment in new equipment and new materials, products in which the domestic supply capacity is far from adequate, and products that are export-oriented, new technologies for the comprehensive utilization of resources and environmental protection. Preference is also given to investment in the mid- and western parts of China, taking advantage of their cheap labor and rich natural resources. Projects that jeopardize national security, adversely affect social and public interests, pollute environments, etc., are prohibited. Investments in the "restricted" category include production facilities that lead to excess-supply capacity in the domestic market, industries that are not yet fully liberalized, and the exploration and exploitation of rare and valuable mineral resources.

The guidelines for foreign direct investment have enhanced the transparency of the admission and approval process for foreign investors. They also provide guidance for policy implementation agencies in screening FDI with a view to maximizing its benefits to the development process and minimizing its negative effects, while protecting the legal rights of foreign investors.

### **2.2.2. Some recent developments in FDI policies**

- *Sector liberalization.* China has gradually liberalized the FDI regime. The most recent movements are the partial opening to FDI of sectors such as airlines, finance, insurance, foreign trade, wholesale and retail activities.
- *Taxation and exchange-rate reforms.* With the taxation reform, the industrial and commercial consolidated tax adopted in the 1950s was abolished. Instead, value-added tax, consumption tax and sales tax are levied on foreign-investment enterprises. The foreign-exchange regime was reformed in 1994. As a result, the dual exchange rate system was abolished and a unified market rate adopted.

- *Reform in import tariff system.* Starting in 1996, import tariffs were significantly reduced. In January 1998, China revised its tariff and tax policies for imported equipment. FDI projects that fall in the “encouraged” category under the “Guiding List of Industries for Foreign Investors” can enjoy exemption from tariff and import value-added tax on equipment imported within the total amount of investment and for the investors’ own use.

Furthermore, China has also strengthened its post-approval screening and monitoring system. A new mechanism of joint annual inspection and audit of foreign investment enterprises has been adopted to ensure that TNCs’ operations are in line with the host country’s laws and regulations. In the meantime, it has standardized practices in audit and inspection, thereby curbing abuse by local government officials in regulating foreign affiliates.

### **2.2.3. Possible future developments**

With such great efforts to reform its economic system over the past two decades, China has succeeded in its transition from a centrally-planned economy to a “socialist” market economy. During the process of transition, China has been offering foreign investors preferential treatment. With market-oriented structures in place, China needs to harmonize the practice of its open-door policy with its changing domestic economic system. The present favorable treatment for FDI, such as tax holidays, lower corporate income tax in the coastal region, has led to unfair competition and market distortions. There is strong pressure to level the playing field for domestic and foreign firms. Possible policy adjustments could be towards national treatment, with the exception of some favorable treatment granted to projects in the western regions. Preferential policies should, therefore, be industry- and region-specific, targeting priority industries and the western part of China, instead of investor type-specific (favoring only foreign investors). Further liberalization in certain industries, such as banking and insurance industry, is also expected to continue, if not accelerate.

#### **Box 1. China’s stance in international trade and investment negotiations**

Over the past two decades, China has actively participated in various international trade and investment negotiations, and has taken steps to orient its trade and investment policy toward greater liberalization. China is committed to gradually open its industries to foreign investors, to consummate its legal system, protect intellectual property rights and improve its trade and investment environment. However, China still sees itself as a developing country, and is unwilling to assume any obligations beyond its current level of economic development, or at the expense of its national interests. As a developing country, China can only proceed with its trade and investment liberalization on a gradual basis, taking into consideration its unique situation and characteristics.

### **2.3. The role of FDI in China’s economic development**

Foreign direct investment has contributed to China’s economic growth and development, and also facilitated the introduction of market-oriented reforms. These, in turn, have provided a favorable environment for FDI.

In general, FDI has brought in financial resources for national development, transferred technology and management know-how, stimulated institutional innovation in state-owned enterprises, generated employment, upgraded work-force

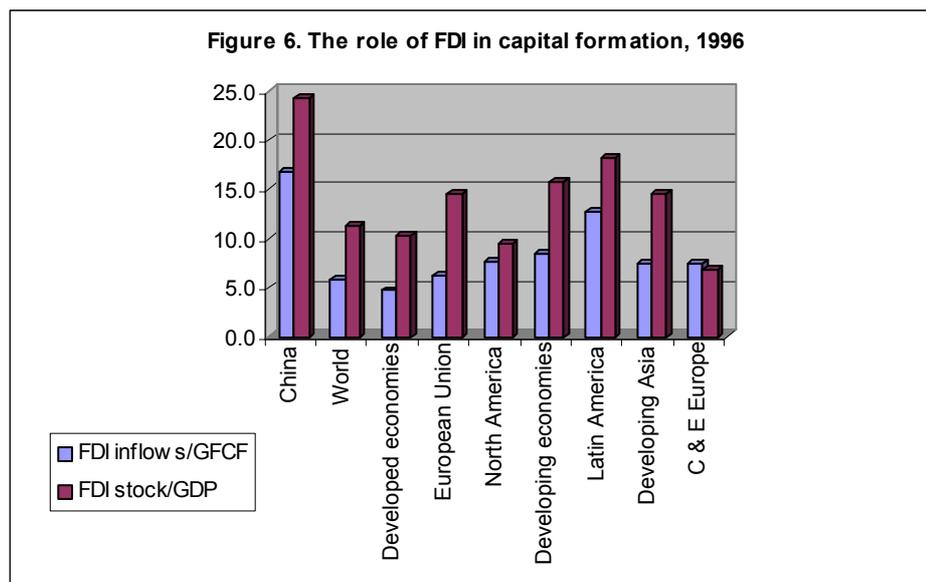
skills, promoted exports, and ultimately, contributed to the growth of output and incomes of the host country. Indeed, FDI has become an important component in China's national economy, and an engine of growth over the past years. Table 1 shows the important role that FDI is playing in China's economy, in terms of its contribution to gross domestic investment, GDP, exports, industrial output, employment and tax revenue. Relative to other countries, China's achievements are outstanding when measured by the ratios of FDI/GFCF and FDI//GDP (see Figure 6).

Table 1. The importance of FDI in China's economy, 1994-1997

Item	1994	1995	1996	1997
FDI inflows (billion dollars)	33.8	35.8	40.8	45.3
FDI inflows as a ratio of gross domestic investment	17.3%	15.1%	17.0%	14.8%
FDI stock as a ratio of GDP	17.6%	18.8%	24.7%	27.6%
Export by foreign affiliates (billion dollars)	34.7	46.9	61.5	75
Share of exports by foreign affiliates in total exports	28.7%	31.3%	41%	47%
Share of industrial output by foreign affiliates in total industrial output	11%	13%	19.1%	18.6%
Number of employees in foreign affiliates	14	16	17	17.5
Tax contribution as a share of total	7%	10%	12.3%	13.2%

Source: James X. Zhan (1999)

In addition to its important role in China's economic growth, FDI has also helped accelerate transition to a market economy and integration into the world economy. Such a role is particularly prominent in the establishment of a market-oriented institutional framework, the diversification of the ownership structure in the economy, the promotion of competition, the reform of public enterprises and opening up to the outside world through trade and finance.



Source: James X. Zhan (1999).

However, problems and impediments do exist with respect to FDI in China. The main ones are:

- *Imbalance in sectoral distribution.* As discussed earlier, FDI is concentrated in the manufacturing sector, generating some excess supply capacity in certain product markets. In the meantime, the level of FDI in infrastructure, energy and agriculture has been very low (see Figure 3). The share of FDI in hi-tech industries has also been modest.
- *Regional imbalance.* FDI inflows are concentrated in the coastal areas (see discussion in the previous section). Only 10 per cent of FDI flows to the inland of China. This widens the gap in economic development between inland and coastal areas. Between 1949 and 1979, annual GDP growth rates in the eastern, western and central parts of China were 7.1%, 6.8% and 7.5% respectively; whereas during 1979-1995, the picture was the reverse, i.e., 12.8%, 9.3% and 8.7% respectively (Xu Ming, 1997).
- *Abuse of transfer pricing.* Foreign investors appear to take advantage of their control of the import or export channels to manipulate transfer pricing in order to evade their tax responsibility (Zhang Cheng, 1991).
- *Implications for competition in the domestic market.* In some product markets, certain TNCs seem to have gained the lion's share through unfair competition.
- *Environmental damage in certain areas.* There are reports of numerous cases of environmental damage, including damage by foreign affiliates. The transfer of the pollution-intensive industries through FDI has also increased the burden of environmental protection and the risk of damage. For example, about 1490 foreign affiliates whose products are detrimental to the ozoneosphere were established during the period 1985-1994 (see Shen Genrong, 1997; and Song Weiyang, 1997).

### **III. Regulatory Framework for Environment Protection**

#### **3.1 China's environmental management system**

##### **3.1.1 The environmental regulatory framework**

China's institutional setting for environmental protection has undergone several transformations over the past decades, reflecting different stages of restructuring, and an increasing emphasis by the Government on environmental issues. The first National Conference on Environmental Protection was held in 1973. The Steering Group on Environmental Protection of the State Council was established subsequently. The Steering Group was upgraded to an Environmental Protection Bureau under the Ministry of Urban and Rural Construction and Environmental Protection in 1982. In 1984, the Commission on Environment Protection of the State Council was founded to coordinate environmental affairs in the country. In 1987, the National Environment Protection Bureau was set up, with a mandate for overall environment management throughout the country. Now the Bureau has been renamed: The National Environmental Protection Administration (NEPA).

The legal framework has also evolved over the past three decades. "The Draft Rules (provisional) on the Protection and Improvement of the Environment" was issued in 1973. Six years later, the Steering Group on Environmental Protection of the State Council promulgated the "Key Points in the Environmental Protection Report". It stated that China could not afford to adopt the approach of "polluting first and controlling later". Subsequently, China formulated "The Basic Law (provisional) on Environmental Protection". As experience accumulated through the implementation of the provisional Law, the formal "Environmental Protection Law of the People's Republic of China" came into effect in September 1989, which set a firm basis for China's environmental protection system.

At present, there are in effect some 30 national laws and regulations related to environmental protection (Box 2). In addition, there are 364 environmental standards in China; and over 600 rules and regulations have been issued by local authorities. All this forms a comprehensive, though complex, legal framework on environmental protection.

**Box 2. Major laws and regulations relating to environmental protection in China**

- Marine Environment Protection Law promulgated on August 23, 1982 effective March 3, 1983.
- Regulations on Prevention of Vessel-induced Sea Pollution, promulgated on December 29, 1983, effective December 29, 1983.
- Regulations on the Administration of Environmental Protection in the Exploration and Development of Offshore Petroleum, promulgated on December 29, 1983, effective December 29, 1983.

### **3.1.2. The status of environmental management system**

The current environmental management system contains four important components:

- *The environmental impact report system.* The Environmental Protection Law stipulates that every project should go through an environmental impact review process, if it is perceived to have possible negative effects on the environment. Project proposals should contain an analysis of environmental impact and the corresponding preventive measures, and be submitted to the environmental administrative authorities for screening. After the review of the proposal, the applicant will further engage a qualified firm to prepare an environmental impact report. It is only after the approval by NEPA or local EPB, that the project can be legally established.
- *The principle of the “three simultaneous steps”.* According to Article 26 of this system Environmental Protection Law, the system requires that a pollution-preventing facility must be designed, constructed and operated simultaneously with the design, construction and operation of the main production line of the

project. To ensure the effective implementation of this system, the environmental authorities are mandated to check the project design in the review process and monitor the construction. Once the construction of the project is completed, inspection and approval by the environmental authorities are required before the project starts operation.

- *The registration and licensing system for the discharge of pollutants.* According to Article 27 of the Environmental Protection Law, those institutions and enterprises that emit polluted substances must register and report in accordance with the stipulations of the environmental protection authorities. This is an important tool in controlling environmental pollution and monitoring environmental damage.
- *The system of effluent charges.* Any firms that dispose of polluting materials above the prescribed standard will be charged an excess effluent fee. However, the charge paid for discharging pollutants does not legalize the pollution process itself. After paying the charges, the enterprises should also bear the costs of controlling and eliminating the pollution, pay fines and compensate for the resulting losses, and face other liabilities. For those enterprises that have already paid the effluent charge, but still failed to meet the effluent standards, the charge will increase by 5% annually, starting from the third year after the original charge is levied.

### **3.1.3 The administrative structure of environmental management**

In China, the mandate of the National Environmental Protection Administration of the State Council (NEPA) covers the overall supervision and management of environmental protection for the entire country. The Environmental Protection Bureaus (EPB) at provincial, city and county levels are responsible for the supervision and management of environmental protection in the respective judicial areas. EPBs have also been established in various industrial authorities, such as the National Marine Administration, the Harbor Supervision Administration, the Fishing and Fishing Port Administration; as well as in the military forces, the public security, transportation, railway system and airlines administration. The administrations of land, mining, forestry, agriculture and waterpower also carry out supervision and management functions relating to environmental protection.

#### *i) The responsibilities of the NEPB*

The responsibilities of the National Environmental Protection Bureau include:

- Setting national environmental standards, in line with the existing economic and technological conditions in the country;
- Establishing nation-wide environmental monitoring system, including the formulation of regulations thereon; coordinating with relevant ministries in re-enforcing environmental laws and regulations; and issuing bulletins on environmental status.

- Setting and implementing the rules for environmental impact reports, assessing the impact of large construction projects on the environment, and evaluating the effectiveness of pollution prevention measures.

*ii) The responsibilities of local environmental protection authorities*

- *Local standard setting.* Governments at provincial and city levels, under the direct leadership of the central government, can set up local standards for environment quality for those projects that are not covered by the national standards. Such standards should be reported to the NEPA. In cases where national standards exist already, local standards are expected to be stricter than the national ones.
- *Environmental management.* EPBs are responsible, by virtue of their jurisdiction, for formulating plans for environmental protection, screening and approval of investment projects that have environmental implications, monitoring the implementation of laws and regulations, and carrying out field investigations on pollution cases. All local environmental protection authorities are supposed to issue environment status bulletins on a regular basis.
- *Coordination.* The environmental protection authorities (above the county level) are responsible for the coordination with other relevant administrations in conducting investigation and assessment of the environmental status of the area concerned. They are also responsible for negotiating solutions; or presenting the case to higher authorities for coordination and settlement, when environmental pollution needs to be prevented and controlled at a cross-regional level.

### **3.1.4. The status and issues of environmental management**

With the rapid economic development, some huge construction projects such as water power plants, iron and steel plants, coal and charcoal enterprises, petrochemical and chemical industry, nonferrous metallurgical industry and nuclear power plants, etc. inevitably have an impact of the environment. Therefore, there are some detailed clauses in various environmental laws and regulations on the implementation and enforcement of the requirements for environmental impact reporting.

In the past several years, the pollution control system in China has expanded from limited control over key polluting sources to a wide coverage of regional and industrial projects. China has established a nation-wide network for environmental monitoring, with over 4,000 environmental monitoring stations. These stations monitor acid rain, the atmosphere, earthquakes, important river systems and marine pollution.

Owing to the strict management by the environmental protection administrations, most large-and medium-sized projects with a potential environmental impact have followed the environmental assessment system. The principle of the "three simultaneous steps" for project construction which come within the purview of the national and local EPBs was applied in about 87% of the projects in 1995, as compared with only 18% in 1976.

The effluent charge for pollution reached RMB2.66 billion (about US\$ 325 million) in 1995, rising from RMB70 million (about US\$ 8.5 million) in 1978. The money was transferred to the environment administration fund.

Performance in the implementation of the environmental management system apparently varies among different regions and cities. The management is stricter in large cities and laxer in small towns and rural areas where township enterprises are concentrated. Some coastal areas, such as some cities and towns in southern Jiangsu Province, have a better environmental management system. They formulate relevant regulations and plans based on a careful assessment of the impacts of local economic development on the environment, and implement them effectively.

The task of environmental management remains a great challenge. Though the present system has played an important role in controlling industrial and municipal pollution, there still exist numerous problems and difficulties. For example, many administrative procedures of environmental protection have been followed mechanically. Some local governments have overemphasized the growth of the industrial output and the quantity of FDI inflows, due to the overriding concern for the economic development of the region. The local EPBs are usually under the supervision of the local governments and are not invested with sufficient authority to screen the environmental aspect of the projects. They are very cautious in checking the projects launched by local leaders or FDI projects. As a result, some projects that are not up to the environmental standards are carried out. Furthermore, some local EPBs do not have adequate enforcement capacity nor the qualified professionals needed. This has seriously impeded the execution of their functions and responsibilities rigorously and effectively.

As a result, some heavily polluting firms do not have to pay full attention to environment protection. Certain enterprises, particularly some township enterprises and foreign investment enterprises, take advantage of the loopholes in the environmental regulatory framework to start some projects which are engaged in pollutant production, and are detrimental to the environment.

The transfer of pollution-intensive industries to China has become a manifest phenomenon over the past years. The issue will be dealt with in Part IV of this study.

To sum up, with great efforts to control pollution and protect environment, China has succeeded in avoiding the rapid deterioration of its environment as its economy grew rapidly in the past two decades. For example, the discharged industrial waste water remained at virtually the same level since the beginning of the 1980s (i.e., 23 billion tons in 1982 and 22.7 billion tons in 1997). Forest coverage ratio increased from 12.4 per cent in 1977 to 13.9 per cent in 1996. However, the overall picture is not that rosy. The density of suspended particles is higher than the international standard level in almost all cities in China. Acid rain has become even worse than before, with a rapid expansion in coverage. In 1996 rivers and lakes were polluted in various degrees, and underground water in almost half of the cities in China was contaminated. Industrial pollution caused by township enterprises has been rapidly increasing over the past 10 years and tends to expand further in the foreseeable future.

### **3.2 The environmental regulatory framework regarding transnational corporations**

In general, China does not have separate environmental standards for foreign investment, although some relevant clauses governing foreign investors' environmental behavior can be found in a number of national environmental, as well as FDI, laws and regulations. In principle, foreign investors must abide by Chinese environmental laws and regulations and meet the host country's environmental standards. Article 18 of the Constitution stipulates that foreign companies, economic organizations and joint ventures operating within the Chinese territory must abide by Chinese laws and regulations. Furthermore, in order to prevent pollution-intensive production from shifting into China, Article 30 of the Environment Protection Law stipulates that the importation of environmentally unqualified technology and equipment is forbidden.

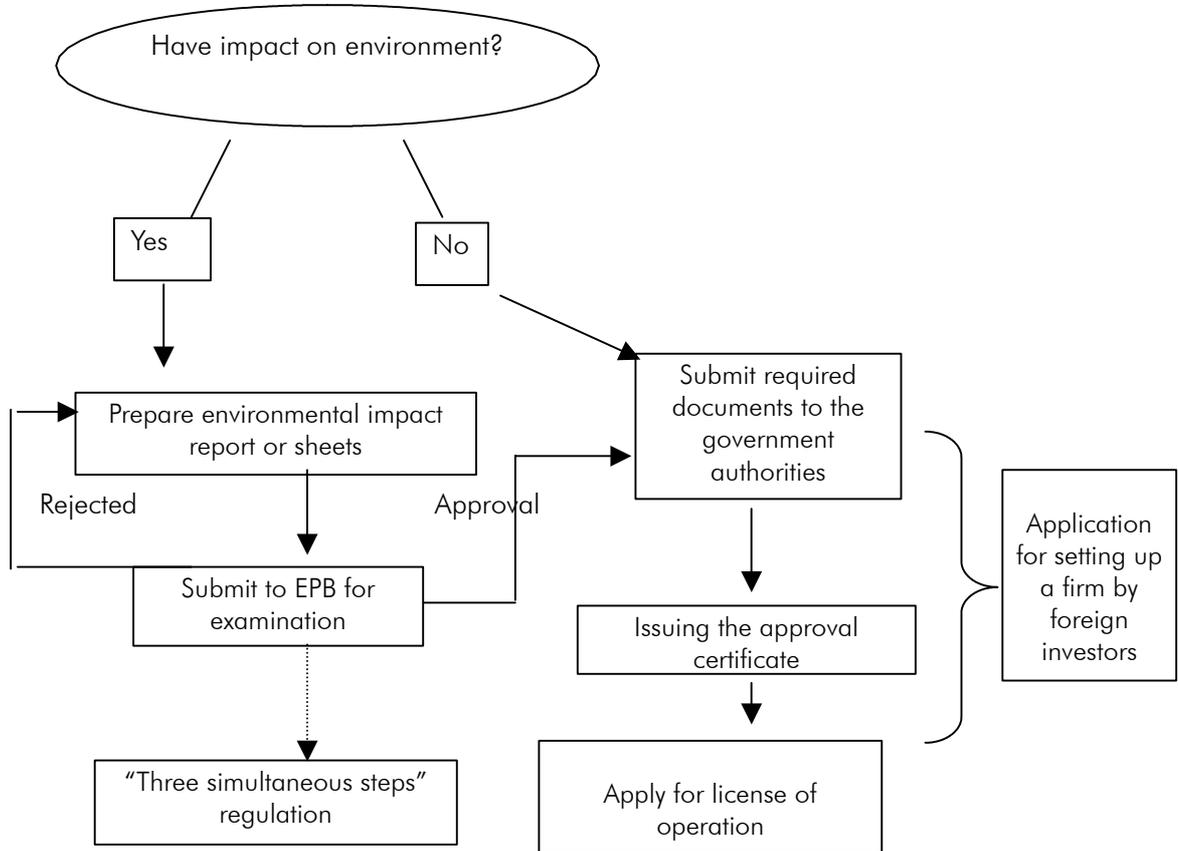
There are, however, some specific policies and administrative procedures governing the screening and monitoring of FDI with respect to environmental protection.

As mentioned earlier, the "Provisions for Guiding Foreign Investment" clearly set out environment protection requirements for foreign investment projects. There are specific provisions encouraging investment in environmentally sound technologies (ESTs), and new technologies for controlling environmental pollution, such as those for recycling or the comprehensive utilization of resources.

In the meantime, the "Guidelines" limit foreign investment in exploring rare and precious mineral resources, and prohibit investment in those that threaten human health or destroy natural resources. According to the "Notice on Reinforcing Environmental Protection Management of Foreign Investment Projects" issued in 1992, foreign investors should abide by the Chinese environment protection laws and regulations. They should prevent environmental pollution and ecological damage, and accept monitoring and supervision by environmental protection authorities. The "Notice" also set out procedures for screening the environmental implications of FDI projects and monitoring their implementation of environment protection measures. Item 5 of "Implementing Regulations on Joint Venture" also stipulates that projects with negative environmental impacts should not be approved. In accordance with the "Regulations of Ocean Oil Exploring by Foreign Firms", foreign investors are required to abide by the relevant environmental laws and regulations in their oil exploration activities, and to protect the environment of the atmosphere, oceans, rivers, lakes and lands. In principle, the procedures for regulating the environmental aspects of FDI are similar to those for domestic firms. The reporting system of environmental impacts, the principle of the "three simultaneous steps", the registration and licensing systems for the discharge of pollutants and the system of effluent charge elaborated earlier (see section 3.1.2) are equally applicable to FDI projects. Furthermore, according to Article 4 of "Project Construction and Operation in Part III of the Application Form (Sample) for Establishing Foreign Invested Enterprises in China", foreign invested enterprises (in the manufacturing and mining industries) should present the indices of Three Wastes (air, land and water pollution) treatment and security. The environmental aspect of

approval procedures for FDI projects in China can be illustrated in the following chart :

Chart 1. The environmental aspect of approval procedures for FDI projects



## IV. Environmental Issues Related to FDI in China

The overall environmental impact of FDI in China is a mix of positive and negative effects. In some cases, it is conducive to the improvement of China's environment. In other cases, FDI is detrimental to the environment and increases environmental risks. Due to the lack of systematic empirical evidence and a sound analytical framework, it is difficult to quantify either its actual positive or negative effects on the environment. It is equally difficult to determine whether foreign affiliates' environmental performance is better or worse than that of comparable local firms'. With that caveat, this section presents preliminary analysis and findings

of some existing studies, as well as a number of highly publicized positive and negative cases.

## **4.1 Environmental problems related to FDI**

Some foreign investors transfer production facilities and technical processes that are forbidden in other countries into China through direct investments. There are cases where foreign investors bought second-hand production equipment that do not meet environmental standards elsewhere and used them in China. This has been a notable phenomenon as about 75 per cent of the foreign direct investment is "investment in kind", i.e., in the form of production equipment (*James X. Zhan, 1994*).

The transfer of production lines that have negative effects on the ozone layer is a case in point. Although there has been strict control over such production lines, some 1490 foreign-investment firms were established between 1985-1994, most of which produce foaming and rinse products. The majority of them (about 60 per cent) came from, or via, Hong Kong, as some of the firms are subsidiaries of companies headquartered in some developed countries. Others were mainly from the Republic of Korea, Japan, the United States and a couple of European countries (*Song Weiyuan, 1997*). This has caused grave concern to the Government as well as the public. Subsequently, administrative decrees relating to the screening and monitoring of environmental aspects of FDI came into being with a view to strengthening the relevant mechanisms.

One general perception is that more environmentally-sound technologies have been used in the projects financed by firms from developed countries. Therefore, the environmental performance of these projects is better than those financed by firms from developing Asia. Nevertheless, even in the projects executed by firms from industrialized countries, the environmental performance of some TNCs is not as good as would be expected. A recent survey of a limited number of samples of European affiliates in China shows that their environmental performance was uneven in various aspects (*Di Changxing, 1997*).

Some foreign investors have set up enterprises to decompose, renovate and process waste metals, electronic appliances, tires, and harmful chemical pollutants. Most of them have a serious impact on the environment. Some of these investors even import foreign garbage into China, ostensibly for the purpose of recycling. Taiwan Province of China used to be an important location for recycling hazardous materials from the United States. In 1993, its Environment Authorities banned trading in waste metal materials. A number of Taiwanese investors relocated their production facilities to the eastern coastal areas, such as Shenzhen, Zhuhai and Changzhou. They continue importing tons of waste materials such as used cells, vehicle plates, computers, adapters and other electrical and electronic components for recycling in China. The impact on the surrounding environment is enormous. Some foreign firms do not pay enough attention to pollution prevention, nor do they adopt adequate and effective measures to treat pollution.

Some of them even try to elude the environmental monitoring mechanism. Most of the incidents happened in the projects financed by medium and small-scale foreign firms. There are, however, incidents involving large TNCs; many of them highly publicized environmental incidents (Box 3), some of them have had serious consequences. In 1996, Fumao Phosphor-Chemical Industrial Ltd. Co., a joint venture set up by a Chinese fertilizer manufacturer, and a Taiwan chemical company in Guizhou province, discharged their sewage into the Yanchang River. It caused very heavy environmental pollution, and over 400 persons were poisoned by phosphorus. The company had ignored the environmental law for a long time. It even refused inspection by local EPB. When its vitriol factory started to operate in September 1995, its accessory environment protection facilities had not even been installed. Furthermore, it switched to the use of an inexpensive raw material of high dense phosphorus content. The facilities could only reduce acidity, but not eliminate phosphorus. The water of high-density phosphorus was directly discharged and resulted in severe pollution. An investigation revealed that the phosphorus content of the sewage discharged from the factory was up to 703.45mg/litre, 250 times higher than the national standard. The Yanchang River polluted by the sewage had phosphorus 20 times higher than the national standard. The EPB of the province fined the factory and directed it to take effective measures to eliminate the pollution (*Ru Enxiao, 1996*).

**Box. 3. Some cases of highly publicized environmental incidents involving TNCs**

A Hong Kong affiliate invested 16 million dollars in Shenzhen to make plastic toys. The firm used a process of adding a large amount of plasticizer such as dibutyl phthalate (DBP) to polyvinyl chloride (PVC). A lot of foul and toxic gas was produced when the PVC was heated and shaped. It was discharged and severely polluted the surrounding area. Besides, the noise of its production facilities reached 06 db, far above the national standard. The case was brought to court and the firm was fined HK dollars 20000 plus investigation and lawsuit fees. The firm was also ordered to control the pollution immediately.

A Sino-Korean leather manufacturer established a totally ineffective sewage draining facility. It discharged sewage 750 greater than the national standard and caused severe damage to the surrounding environment. Many nearby residents complained of it. Although the company was amerced three times, it did not take any measures to control the pollution until the case was exposed on a China Central TV show.

In northeast China, a well-known joint venture was set up by a Thai TNC and a local partner. The investment was about US\$ 24 million in the first phase. It was supposed to be screened and monitored by NEPB. However, the company went into operation in 1992 without going through the environmental administrative procedures. The company did build facilities to dispose of the waste water, but they were far less effective in function. The environment protection engineers and the senior management in the company were not aware of the national standard for discharging waste. In the second phase of investment, a sewage disposal facility costing US\$1.8 million did not complete its civil work until May of 1997. It was estimated that highly polluted sewage of 30 million tons was discharged through the Yinma river into Songhua river in 1997.

A foreign affiliate manufacturing plastic products in Longhai city imported "industrial raw material" from Europe. There were 100 containers and weighed over 1000 tons in total. When the firm opened the containers and made a spot check, it found they were all filled with industrial garbage. However, the company neither asked for compensation nor replacement. They just left it out in the open. The stench was extremely foul outside the workshop.

A rather large-scale foreign affiliate located along Shaxi river in Xianyou county produced leather products. It did not pay much attention to controlling environmental pollution, contributing thereby to the further deterioration of the quality of water. Polluted water affected the living and working conditions of tens of thousands of inhabitants in the lower reaches of the river. The factory had to invest a large amount of money later to improve its processing facilities and planned to invest another US\$240,000 for laying a pipe 12 kilometers long. The sewage was meant to discharge into the harbor after its disposal according to the standards. Another foreigner leather manufacturer located along Mulan river in Putian city, started its business without any environment protection measures. The firm discharged a large amount of waste water directly into Mulan river without proper disposal. This caused strong discontentment in nearby area. Five months after the firm started its operations, angry people destroyed the factory draining conduit and the production had to be terminated.

Workplace safety is another serious problem. Some TNCs that conduct operations with a high safety-risk do not address health and safety issues effectively in accordance with relevant laws, regulations and policies on labor protection. Efficiency in export processing is the motivation behind investing in China. They employ cheap labor from the inland rural areas. The footwear industry of Fujian province, for example, has a significant share in both China's domestic market and its exports (bearing in mind that China has been the world's single largest footwear exporter). There are numerous foreign affiliates, some of which use a large amount of solvents. There is lack of effective disposal measures for discharged triphenylmethane. Some employees in these factories were poisoned or died of exposure to noxious substances without protection.

In general, China's environmental standards are much lower than those of developed countries. This provides opportunities for some TNCs to take advantage of the lax environment standard and transfer their out-of-date technologies and pollution-intensive products to China. For example, the standard for effluent in some developed countries is based on the total quantity of discharge, while in China it is based on the density of the effluent. Some firms can dilute their effluent before discharging it (*James X. Zhan, 1999*).

The screening and monitoring mechanism in China is also much more flexible than those of developed countries, and even those of the more developed developing countries. Furthermore, the significant decentralization of the FDI approval authority from the central government to provincial, and from provincial, to city levels has, to a certain extent, further weakened the screening and monitoring mechanism on environmental protection. Indeed, no one argues publicly that lower environmental standards should be applied to foreign firms, nor can that environmental problems caused by the foreign investors be ignored. However, there are some local government officials who try to accommodate, even to lure, foreign investors whose projects have serious implications for the environment. Some local governments over-emphasize their local economic growth, and do not insist on following the principles of environmental protection. This has been the cause of many environmental problems. According to a survey made by the relevant administrations, only 97 out of 382 economic development areas in 16 provinces have conducted regional environment assessments. Some local officials even ignored the environmental protection laws and regulations, and decided to build polluting projects in water-source areas or in natural conservation zones.

## **4.2. FDI and pollution-intensive industries**

Over the past two decades, industries such as chemical, petro-chemical, leather, printing and dyeing, electroplating, pesticide, paper, mining and metallurgy, rubber, plastic, construction material and pharmaceutical production have been among the "bright spots" for foreign investment in China. They are often referred to as pollution-intensive industries, as they usually rank high in emissions intensities of pollutants. Pollutants are waste residuals--harmful by-products of industrial processes that are not profitable to recycle or resell at current prices. Sometimes, they are also intensive in the use of other inputs, particularly bulk raw materials, energy and land (*Mani and Wheeler, 1997*). Those industries have been perceived as one of the major sources of environmental pollution in China.

A study based on the industry survey of 1995 shows that about 30 per cent of the FDI in China was in pollution-intensive industries, out of which 13 per cent were in highly-pollution-intensive industries (see Table 2).

*Table 2. FDI in pollution-intensive industries in China, 1995*

	Number of firms	Industrial output (yuan)	Employees
FDI PII <sup>1</sup>	14,189	379.3 billion	2.19 million
- share of national total	2.8%	6.9%	2.6%
- share of total FDI	28.6%	35.4%	33.1%
FDI in HPPII <sup>2</sup>	6,493	186.7 billion	0.91 million
- share of national total	1.27%	3.4%	1.1%
- share of total FDI	13.1%	17.4%	13.8%

Notes:

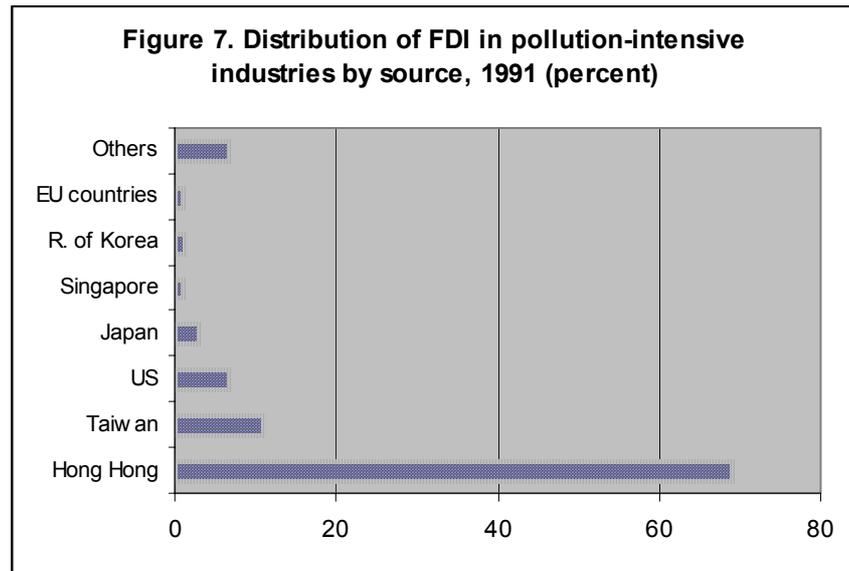
1) FDI in PII includes FDI in HPPII.

2) PII and HPPII refer to pollution-intensive industries and highly pollution-intensive industries.

Source: Xia, based on China Third National Industrial Survey, 1995.

It should be noted that the magnitude of FDI shown in Table 2 only reflects the actual inflows before 1995. A large number of FDI projects came into operation between 1996-1998. FDI share of pollution-intensive industries in the country's total should be much higher today. Furthermore, measured by foreign affiliates' share of the assets or sales in a particular industry, the degree of FDI involvement in those pollution-intensive industries is generally higher than the average level of involvement by FDI in all industries. In 1995, FDI involvement (measured by share of assets) in those industries was 20.3 per cent higher than the average level of FDI in China (16.9 per cent) (Wang Luolin, 1997).

Among other determinants, an increasing tightening of regulations in major home countries, a lower level of environmental standards and weak monitoring mechanisms in China are the main reasons for inducing FDI into those industries. In fact, the relocation of pollution-intensive industries is not a unique phenomenon in China. As one recent study of cross-country analysis (Mani and Wheeler, 1997) shows that pollution-intensive output as a percentage of total manufacturing has fallen consistently in the OECD and risen steadily in the developing world. Moreover, the periods of rapid increase in net exports of pollution-intensive products from developing countries coincided with periods of rapid increase in the cost of pollution abatement in the OECD economies.



Source: Di Changxing, based on *Aluminum of China's Foreign Trade and Economic Cooperation*, 1992.

There can be greater environmental implications by FDI from more developed developing Asia than from developed countries. The share of developing Asia in total FDI in pollution-intensive industries is consistent with its overall share of FDI stock in China (figure 7). This is possibly due to the rapid change in locational advantage for pollution-intensive industries and the tightening of environmental regulations in the home economies. Indeed, some studies suggest that such transitions actually occurred in Asia. One analysis Asia (*Mani and Wheeler, 1997*) shows that the growth experience of pollution-intensive industry in Asia reflects a cascading pattern. It begins in Japan in the early 1970's, and continues for two decades in the NIE's and later on to ASEAN, and now China, Viet Nam and the South. It can be assumed that such cascading pattern coincides with the "flying geese formation" in Asia (*James Zhan, 1999*).

A rather prevailing view holds that large amounts of FDI flows into pollution-intensive industries can have serious negative implications for China's environment. This has caused grave concern in China. However, there can be a different argument in this respect. One should differentiate the relocation of production into those pollution-intensive industries from the transfer of pollution itself (*James Zhan, 1999*). First, massive FDI into those pollution-intensive industries may not be mainly due to environmental considerations. Other determinants, such as labor costs and skills as well as infrastructure, are usually more important. Second, not all foreign affiliates in those industries produce severe environmental damage. Some foreign affiliates utilize environmentally-sound technology and produce no pollution at all (see the next section). This has been particularly the case in the pharmaceutical industry, where TNCs facilitated the transformation of that industry into a much more environmentally friendly one. Third, it is true that the expansion of production capacity in those pollution-intensive industries has increased the burden of environmental protection. But, such expansion could make it easier to achieve economies of scale and employ advanced environmentally sound technology.

Furthermore, in the absence of FDI, it may take China a long, long time to develop such a production capacity with much inferior technology, causing more serious environmental damage. Consequently, the cost of development would have been much higher than it is today. One should also note that over 60 per cent of the FDI are in the form of joint ventures. The decision on the level of technologies utilized in the production facilities may not always be in the hands of foreign partners, particularly in those ventures where the Chinese partners have ownership control. In conclusion, one should not only focus on industry location, but rather on the environmental performance of foreign ventures relative to domestic firms. What is important is not why a firm locates where it does, but how it performs once it gets there.

Having said that, those foreign investments that are seeking short-term unethical gains with serious environmental damage should be prohibited. While allowing for FDI in pollution-intensive industries, strict screening and monitoring mechanisms should be in place to ensure that only environmentally-sound technology is transferred and environmental risks are minimized during operation.

**Box 4 . Risks of environmental damage: the case of Fufa Glass Ltd.**

The environmental damage caused by foreign affiliates is not all due to their ignorance of the host country environmental laws and regulations. Some damage is merely accidents. Guangdong Fufa Glass Ltd. Co. located in Shekou Industrial Area of Shenzhen is an example.

The company is a joint venture of U.S. and Thai firms with a Chinese partner, with a total investment of US\$100 million. It started its initial operation in July 1987. With advanced technology and the modern managerial system from the United States, the company established a sound environmental management system. Facilities were built and various measures of environment protection were in place. In February 1998, the company switched its original No.20 heavy oil to No.200 heavy oil. The latter has a high solidifying point and a high viscosity, which is better suited to circulate and burn within pipe. However, the temperature of returned oil increased within the pipe when the pipe was heated up, resulting in emulsification within the container and the volume increased rapidly. When the automatic device for controlling liquid level was out of control, the oil overflowed from the top of the container and spread on the lawn at the back of factory. Despite some emergency measures, part of the oil flowed into sewers and polluted the environment.

The company completely cleaned the smeared lining of two 600m oil pipes from factory to the sewage system during the reflux period. Meanwhile, they fixed the automatic controlling device for the oil-reserve can, lowered warning height and increased inside space to prevent the recurrence of such accidents.

The case shows that even if advanced technology and environmental management system are in place, accidents can not be completely avoided and the implications for the environment can be serious.

### **4.3. Positive Environmental Contributions by TNCs**

TNCs, particularly the major ones in the world, have contributed to China's environmental protection in one way or another. Apart from the advantages of

technology and management, TNCs are usually large compared with domestic firms. Being large means that a company has greater resources for investment in research and development, as well as environmental management systems. Some TNCs have been actively involved in environmental services such as waste management and cleaning projects; others use environmentally friendly technologies in their production. They also generate demonstrative impacts on domestic companies in implementing ISO 14000 standards on Environmental Management Systems.

Some TNCs are active in building infrastructures of environmental protection in China and cooperate with the Chinese Government in dealing with environmental problems. They transfer environmentally-sound technologies through FDI. Examples are abundant:

- Linde Co. has established 6 sewage disposal facilities and two urban sewage disposal facilities in China. Other companies, such as WABAG, Hochtief, Sulzer, Geiger, Brochier Westfalia Separator, also produce sewage disposal equipment or parts and components in China.
- Preussag-Noell Co. is very active in supplying sulfur-detaching facilities to China and participating in building demonstration garbage disposal facilities in two areas of Beijing.
- Siemens, Deutsche Babcock took part in upgrading a project of Yangshupu Electricity Factory in Shanghai. Uhde, Lurgi, ABB, Steag and Lentjes also participated in constructing and upgrading the electricity generation plants and supplied the technology for efficiently utilizing energy and filtering equipment.
- Canadian Ruiwei Environmental Protection Co. has technological advantage in generating electricity by garbage incineration. It invested US\$150 million in a power generation plant in Guangdong, which has a capacity of 500 tons of garbage disposal daily. The plant uses 5 CAO garbage incinerators with a capacity of 12Mw.

In its industrial guidelines for foreign investors, China encourages FDI in the production of pesticides that are highly effective, of low toxicity and hazard-free, as well as fertilizers of high concentration. Many TNCs, particularly large ones, have introduced new types of fertilizers, which contributed to the improvement of the product structure of fertilizers in China. For example, Aigefu's affiliate in Tianjin produces insecticide-deltamethrin, which has improved the product line in the market. A joint venture between DuPont and Shanghai Pesticide Factory produces a new patent herbicide, which is highly popular for its high-effectiveness and low toxicity.

Some TNCs have taken the lead in adopting international environmental standards. For example, Shanghai Gao Qiao BASF Dispersions Ltd. Co. is the first chemical firm to obtain ISO14000 certificate on international environment standards in China (Xia Guang, 1996). BASF also set up R&D fund for research projects in the fields of organic pigment, dyestuff chemistry, and polymer chemistry, in new material and natural effective components, as well as new design of chemical engineering and factory construction. Shanghai Squipp Co., a Sino-American joint venture is the first pharmaceutical manufacturer in China to obtain

ISO14000 certificate on international environment standards. Since 1996, 36 companies in China obtained ISO 14000 certificate, of which 25 were foreign affiliates. Since 1994, China embarked on environmental labeling certification, 40 out of the 86 firms that obtained such certificates were foreign affiliates (*Xia Yuofu, 1998*). This has certainly exerted pressure on the domestic firms to apply high environment standards in their production.

As illustrated above, through the establishment of joint ventures in China, TNCs can upgrade the overall level of technology in local industries and help domestic enterprises manufacture products of low-pollution and low-energy consumption. For example, Liebherr Co. has been over the years cooperating with the Chinese manufacturer Haier to produce fluorine-free refrigerators. In the pharmaceutical industry, a large number of major domestic producers have formed joint ventures with foreign TNCs, and pollution by this industry is now greatly reduced, even disappeared owing to advanced technology and a sound environmental management system. In many cases, TNCs transfer managerial skills, including those related to environmental management to their local partners.

Many TNCs have established advanced pollution disposal facilities. A survey conducted by EPB in Shenzhen in 1986 covered 75 per cent of the industrial companies operating in the city. The survey showed that most foreign investors follow environmental regulations. In general, their negative impact upon the local environment is less than that of domestic firms (see Table 3). The results of the survey also showed that most foreign affiliates enjoy higher efficiency. Their resource consumption was lower than that of domestic firms. What is most impressive is that foreign investors invested much more than domestic firms in facilities in environmental protection. Their environment protection facilities were either imported or made in the host country. In regard to the efflux of the three wastes, the coefficient of product value of waste water discharged from foreign-investment firms is only around 57.5% that of the local firms, but the pollutant density of waste water of foreign investment firms is higher than that of local firms. In term of effluent waste gas, the ratio of product value of waste gas discharged by foreign investment firms is only 21.7% that of local firms. It is not only due to the environmentally sound technologies used by the foreign investment firms, but also to their low level energy consumption and their energy consumption composition (*Liu Suqin, 1990*).

*Table 3. Survey of FDI in Shenzhen, 1986*

Items	Foreign Affiliates	Domestic firms
Fixed assets for EP/total fixed assets	2.27%	0.94%
Coal consumption/output (10 thousand coal/Yuan 100 million)	0.35%	0.73%
Water consumption/output (ton/Yuan 10 thousand)	39.20%	82.50%
Waste water emission	58% of the domestic firm average	-
Air pollution	22% of the domestic firm average	-

Source: Lin Suquin, 1990.

The above comparison was made only between the foreign investment firms and local firms in the same industries, and only between firms in Shenzhen. Further research work on a larger scope and in greater depth is required in order to understand better the cross-border environmental behavior of TNCs.

Some large TNCs with good track records are environmentally sensitive in their investment decisions. They conduct careful investigations on environmental conditions of the sites before building their production facilities, so as to avoid future disputes on environmental impact. Environmental conditions, therefore, become one of the locational determinants in investment decisions for some of those TNCs investing in pollution-intensive industries.

It is hard to reach any general conclusions on whether TNCs helped local industries to improve environment management through their forward or backward linkages. This remains a subject for further investigations in the case studies. Nevertheless, TNCs exert demonstrative influence to the local industries in utilizing low-energy-consuming, low-polluting technologies, and by adopting environmental management techniques systems in their ventures in China.

## **4.4. Policy debates and public concerns regarding TNC related environmental issues**

### **4.4.1 Debate on environmental standards for TNCs**

There are different views on the question of which environmental standards should be applied to TNCs operating in China:

- Some, environmentalists in particular, hold that in principle TNCs should be encouraged to apply the standards of their home countries. Nevertheless, they are, for the time being, allowed to adopt standards lower than those of their home countries, but they must be higher than the current standards in China.
- Some Government officials, notably those dealing with economic affairs (e.g., MOFTEC and SETC), believe that China should adhere to the principle of national treatment. The same environmental standards, i.e., host country standards, should be applied to all firms operating in China, be they state-owned, township or foreign owned.
- Officials from NEPB have suggested that, in principle, host country standards should be used. But, for those projects with high levels of pollution and high-environmental risks, particularly in the absence of an ideal solution to their environmental damage, high standards should be established. Regarding those special cases in which China has not yet set relevant standards, home country standards should be required (Xian Guoan, 1996).

### **4.4.2 The environmental impact of FDI from a local perspective**

There is no obvious disagreement on the environmental impact of FDI among areas in China. The degree of importance attached to it by local governments, and their environmental performance, however, vary from one area to another. In the coastal economically developed areas the desire for environment protection is stronger because their higher level of economic development and pervasive environmental pressure resulting from rapid economic growth. Therefore, it is easier for these areas to achieve consensus on environmental protection, and the implementation of environmental policies is rigorous and effective. In the areas of lower level of development, local governments have greater interest in FDI than environmental protection. Economic development is often considered of utmost important and environmental protection is given a low priority. Environmental measures are frequently remedial rather than preventive. This is based on the argument that the region will become less polluted as rising incomes make a cleaner environment more desirable and affordable. Economic development will eventually take care of pollution.

#### 4.4.3 Public attitudes towards the environmental implications of FDI

Public attitudes towards environmental protection in China are paradoxical. Although every one believes in protecting human living conditions and improving the quality of the environment, a strong voice often comes out to debase environmental protection when there is conflict between economic growth and environment protection in China. According to a survey of residents around Beijing (Hu Dayuan, 1996), housing and security were considered the issues of deepest concern among all social and economic issues listed. Health care and education ranked second, and then came the environment, traffic and employment. The results show that environmental problems are not considered as the most important, although they are very severe in the municipalities like Beijing.

##### **Box. 5. China's Stance in International Debates on the Environmental Aspects of TNCs' Activities**

In the international arena, China participates actively in environmental protection negotiations related to trade and investment. China has joined over 20 international environmental protection agreements. Among the major ones are:

- The Montreal Protocol on Substance that Deplete the Ozone Layer;
- The Basel Convention on Control of Transboundary Movements of Hazardous Wastes and their Disposal;
- Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships;
- 1973 Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matters into Oceans;
- Declaration on the Human Environment, Nairobi Declaration;
- World Conservation Strategy, International Convention Relating to Intervention on the High Sea in Oil-Spills Accidents;
- Treaty on Principles Governing Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies;
- Vienna Convention on Ozone Layer Protection, Rio de Janeiro Declaration, Agenda of 21<sup>st</sup> Century etc.

In the Sino-German and Sino-Danish agreements on mutual promotion and protection of investment, there are no specific articles dealing with matters related to environment protection. Nevertheless, there are some indirect indications relating to environmental issues. For example, the Sino-German agreement states that steps taken under the priority given by one party with regard to its national economic development during certain period of time should not be regarded as "discrimination". The agreement also states that the steps taken by one party for reasons of public security, health or ethnic problems should not be regarded as "discrimination". One could argue, however, that the definition of "pollution detrimental to public health" is narrower than that of environmental and industrial pollution in general.

This explains why favorable policies are accorded to FDI by local governments in order to improve their local investment climate for foreign investors. In the meantime, the authorities of local environmental protection administrations are often eroded, giving way to economic considerations. Many people argue that strict environmental regulation will make investment less attractive and frighten foreign investors away from China. Only those people who were direct victims of environmental damage voice strong opinions on the control of the environmental performance of foreign affiliates.

## **V. Conclusions and implications for further research**

China has realized remarkable achievements, by any measures, in attracting FDI since its opening to the outside world in 1978. FDI has been an engine of economic growth in the country in the 1990s. It is estimated that FDI has contributed an average of 2.3 percentage points of the annual average GDP growth over the past decade (Zhan, forthcoming). Furthermore, China became one of the top ten trading nations in the world in 1997. 2.9 percentage points of its 8.8 per cent GDP growth in that year were contributed by foreign trade, while almost half its foreign trade was carried out by foreign affiliates in China. Various indicators presented earlier in this study have demonstrated the outstanding role of FDI in China's economic development.

In addition to their positive impact on China's economy, TNCs, notably large ones, have also made remarkable contributions to China's environmental protection both through direct investment in environmental protection and by improving products and production processes in a number of industries. They also present a demonstrable impact on domestic firms in adopting higher environmental standards.

As was shown earlier, large numbers of FDI projects are located in those so-called pollution-intensive industries. Among other determinants, increased tightening of regulations in major home countries, and lower-level environmental standards and a weak monitoring mechanisms in China are the main factors in inducing FDI into those industries. This has certainly increased the risk of environmental damage and the burden of environmental protection in the host country. Highly publicized environmental incidents are numerous. However, differentiation needs to be made between the relocation of production into those pollution-intensive industries and the transfer of pollution. Foreign affiliates in those industries have varying environmental performance, depending on the size of the firms, type of ventures, source of investment, type of industry, motivation of investment and business performance.

The study shows that FDI generates both positive and negative effects on China's environment. To identify the scale of such effects, however, is extremely difficult. Moreover, the degree of government intervention in environmental regulation remains highly controversial. Although data restrictions have prevented us from providing a comprehensive assessment of the FDI impact on China's environment, our study does point to some interesting findings and implications for future research and policy analysis. Further examination, especially at firm level, is highly desirable, with a view to providing a solid basis for the Government to

formulate effective policy measures. Case studies need to focus on the investigation of the cross-border environmental management systems within the TNCs' integrated production networks, and on the identification of the actual level of technologies employed, be it at home country level, host country level or the level in between.

Based on this contextual study, the following preliminary conclusions could be drawn and the issues be further examined:

- Large, notably world leading, TNCs tend to consider their environmental performance as part of their image-building endeavors. Furthermore, their production is usually standardized globally, and it is more financially viable for them to invest in environmental protection. Therefore, they are more sensitive to environmental protection in the host countries. Small firms, especially those involved in short-term investment and footloose ones are sometimes reluctant to invest in environmental protection.
- Export-oriented, efficiency-seeking FDI, in particular by firms that export their products back to home countries is likely to pay more attention to the environmental implications of both their products and production processes, as the requirements of the importing countries are high. Whereas, those market-seeking FDI in developing countries, have fewer incentives to comply with the home country standards. Their products need to be tailor-made for the host market and sensitive to the consumer income level in the host country.
- Foreign affiliates' environmental performance also depends on their ownership structure. Sometimes, the ownership control of a joint venture is in the hands of the domestic partners, who are usually more cost-sensitive. In this case, it is unfair to blame the TNCs' for introducing less environmentally-sound technology into the venture.
- Economic performance can also affect individual firms' environmental behavior. Those who have constantly faced financial difficulties and low investment returns may consider environmental protection of secondary concern as they are pre-occupied with the question of survival.

There seems to be greater environmental implications by FDI from more developed developing Asia than from developed countries. This is possibly due to the rapid change in locational advantage for pollution-intensive industries and the tightening of environmental regulations in the home economies. It can be assumed that the cascading pattern of pollution-intensive industry in Asia coincides with the "flying geese formation" in Asia (*James Zhan, 1999*).

The overview of FDI patterns in terms of source, types, sector, and regional distribution has indicated the possible magnitude of implications of FDI for China's environment. All these factors need to be brought into perspective in assessing the environmental impact of FDI. Government intervention in environmental performance of the TNCs, even if appropriate, remains a challenge. To what extent a trade-off can be made between economic development and environmental quality needs to be addressed further. Effective ways and means have to be identified with a view to attracting environmentally friendly investment and encouraging the transfer of cost-effective pollution-control technologies. Screening and monitoring

mechanisms clearly need to be strengthened in order to maximize the economic benefits and minimize the negative environmental effects of TNCs' operations.

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### Appendix I. FDI in China 1979-1998

Years	Number of Projects	FDI approval (USD Billion)	Actual FDI Inflows (USD Billion)
Total	304821	520.39	221.85
1979-1982	920	4.958	1.769
1983	638	1.917	0.916
1984	2166	2.875	1.419
1985	3073	6.333	1.956
1986	1498	3.330	2.244
1987	2233	3.709	2.314
1988	5945	5.297	3.194
1989	5779	5.600	3.393
1990	7273	6.596	3.487
1991	12978	11.977	4.366
1992	48764	58.124	11.008
1993	83437	111.436	27.515
1994	47549	82.68	33.767
1995	37011	91.282	37.521
1996	24556	73.276	41.726
1997	21001	51.004	45.257
1998	n. a.	52.132	45.582

Source: MOFTEC, China

## Appendix II. FDI in China, by Sectors (1979-1997)

Sectors	No. Of projects approved	As percentage of total	FDI approved (billions of US\$)	As percentage of Total
Total	304821	100	520.42411	100
Agriculture, forestry, animal husbandry and fishing	8231	2.70	9.31485	1.79
Industries	227072	74.4	312.3972	60.02
Construction	8268	2.70	16.03585	3.08
Transportation & communication	3242	1.06	11.55423	2.22
Commerce & food services	15549	5.10	19.44275	3.73
Real estate and public utilities	31332	10.28	141.06785	27.10
Health, physical, & welfare services	931	0.29	4.40943	0.85
Education, culture, broadcast & video	1274	0.42	1.94509	0.37
Science & technological services	2179	0.70	1.58428	0.30
Others	11548	3.78	16.27941	3.13

Source: MOFTEC, China

### Appendix III. FDI flows in China (1983-1997)

By Source (billion of USD)

Countries/Regions	1983-1986		1987-1992		1993	
	Value	%	Value	%	Value	%
Hong Kong and Macao	3.504	53.6	20.199	72.8	17.8613	64.9
Taiwan	0	0.0	1.8941	6.8	3.13859	11.4
Japan	0.9894	15.1	2.8363	10.2	1.3241	4.8
U.S.	1.023	15.7	2.0733	7.5	2.06312	7.5
Korea, R.	0	0.0	0.11948	0.4	0.37381	1.4
ASEAN	0.0609	0.9	0.59984	2.2	1.01434	3.7
EU	0.42	6.4	1.0	3.6	0.67124	2.4
Total	6.535	100	27.761	100	27.515	100

	1994		1995		1996		1997	
	Value	%	Value	%	Value	%	Value	%
H.K & Macao	20.1748	59.7	20.5002	54.6	21.2577	50.9	21.0265	46.5
Taiwan	3.39104	10.0	3.16155	8.4	3.47484	8.3	3.2894	7.27
Japan	2.07529	6.1	3.10846	8.3	3.67935	8.8	4.3265	9.56
U.S.	2.4908	7.4	3.08301	8.2	3.44333	8.3	3.2392	7.26
Korea, R.	0.72283	2.1	1.04289	2.8	1.35752	3.3	2.1424	4.73
ASEAN	1.89159	5.6	2.64417	7.0	3.17732	7.6	3.4179	7.55
EU	1.53769	4.6	2.13131	5.7	2.73706	6.6	4.3497	9.61
Total	33.7665	100	37.5205	100	41.7255	100	45.257	100

Source: MOFTEC, China

## Appendix IV. FDI from Germany

Germany is one of the major sources of FDI in China. By mid-1997, the accumulated inflows from Germany reached UD\$ 2.23 billion. 1589 investment projects were approved with a commitment of US\$ 5.65 billion. The characteristics of German investment are as follows:

FDI from Germany is gradually increasing. From 1981 to 1989, German investors were cautious in entering the Chinese market. There were few projects. 1992 is the turning point and FDI increased rapidly during 1994-1997. German FDI is now ranked the 8<sup>th</sup> largest FDI home country in China.

### The Status of German Direct Investment in China

Year	1990	1991	1992	1993	1994	1995	1996	1997
Actual FDI(million of dollars)	64	161	89	56	1233	386	518	993
FDI projects approved	13	21	130	320	314	..	256	221

The majority of the investors are major TNCs. Among the top ten TNCs based in Germany, only the No. 7 largest, BMW Group, have not yet invested in China.

German investors tend to have more ownership control on their ventures than investors from other countries. 31 per cent of the Sino-German joint-ventures have the German equity shares ranging from 25-49 per cent; 28 per cent of the German investors owns over 50 per cent of the joint-ventures. Nine per cent of the German affiliates is wholly owned by German investors. There is no case that the German partner holds less than 25 per cent of the joint ventures.

The majority of the projects are in manufacturing. For example, the total investment by German companies reached US\$ 512 million in 1996, 80 per cent of which was in manufacturing industry (including US\$ 149 million in machinery, US\$ 138 million in chemical industry, US\$ 71 million in power generation). US\$ 80 million (16%) was in real estate. Investment in the above two industries dominated 96% of the total investment in 1996.

German investors emphasize on long term systematic investment. They do not only treat China as a developing market, but also regard it as a production base, an ideal base for export to Asia and other parts of the world. Therefore, the investment made by Germans is usually large scale, long-term investment with modern technology and management know-how. Many German companies tend to reinvest their investment earnings in plant expansion and equipment maintenance and upgrading.

### Some leading firms invested by German TNCs in China

Name of Corporation	Location	Sales* (USD Million)	Assets* (USD Million)	Total investment(USD Million)	Parent Firm
Shanghai-Volkswagen Automotive Co. Ltd.	Shanghai	2964.23	1403.98		Volkswagen AG
First-Auto/Volkswagen	Changchun	359.64	1177.14		Volkswagen AG
Yangtze BASF Polyphethyl-ethene Products Co. Ltd.				138.9	BASF AG
Tianjin Henkel Detergents & Cleaning Products Co. Ltd.	Tianjin	68.78	36.93	29.99	Henkel KGAA
Siemens (China) Co., Ltd.	Beijing	63.75	182.39		Siemens AG
Kunming Cellulose Acetate Fibre Co. Ltd.	Yunnan			54.1	Hoechst AG
Zhuhai Cellulose Acetate Fibre Co. Ltd.	Guangdong	43.22	38.22	54.1	Hoechst AG
Hoechst-Huabei Pharmaceutical Co. Ltd.	Hebei			27.0	Hoechst AG
Bayer Medical and Health-Care Products Co. Ltd.	Beijing			30.0	Bayer AG
Bayer Wuxi Chemical Co. Ltd	Jiangsu			24.0	Bayer AG
Layin Chemical (Qingdao) Co. Ltd.	Shandong			22.3	Bayer AG

Note: \* the data of assets and sales of 1996-1997.

## Appendix V. FDI from Denmark

### The Status of Danish Direct Investment in China

Year	1990	1991	1992	1993	1994	1995	1996	1997
Actual FDI inflows (USD million )	10.4	0	11.8	4.2	510.3	35.4	28.9	16.8
Projects approved	0	0	9	30	21		22	20

Danish TNCs increased their investment in China steadily in the 1990s. Up to 1997, the total FDI amounted to US\$ 98.6 million. Generally speaking, Danish investment in China is characterized by late coming, small scale and low technology content. There are, however, some huge projects with high technology by Danish TNCs, such as the Novo Nordisk (China) Ltd. This enzyme preparation production project started production in 1998, with US\$ 240 million invested by Novo Nordisk. High technology was introduced into its Tianjin plant. It also follows high environment standard in designing the production lines and setting up advanced facility to deal with the waste water and waste materials. Another notable large investor in China is the shipping company Maersk, which was the first company to introduce containers in China in 1979. It is today the largest non-Chinese shipping-business in China (Eriksen and Hansen, 1999).

### Some leading subsidiaries of Danish TNCs in China

Name of the corporation	Location	Parent firm	Total investment (USD million)
Novo Nordisk (China) Co., Ltd.	Tianjin	Novo Nordisk Corp.	243.00
Jiahe Industrial Co., Ltd.	Suzhou		30.00
Dan-Ni-Shi-Ke (China) Co., Ltd.	Suzhou	Dan-Ni-Shi-Ke Corp.	25.70
Shantou Dan-Nan-Fen Development Co., Ltd.	Shantou	Nor-De-Teng Energy Group	25.00