

# Chapter 3

## LITERATURE REVIEW

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To understand the importance of recent changes in the PRD, I place them in a larger context, that is, China's and international context. In this chapter, a wide range of literature on Chinese and global economy, especially foreign direct investment, environment, and the relationship between them will be examined based on globalization and sustainability theories.

### **Economy and FDI**

#### ***Defining Foreign Direct Investment***

Foreign direct investment is a particular type of foreign capital, as opposed to domestic investment. Fu argues that it does not include loan capital provided by international organizations, foreign governments, or private commercial banks. Nor does it automatically include portfolio investments such as stocks and bonds purchased by foreigners. What makes investment "direct" as opposed to other forms of foreign capital is the concept of managerial control over an enterprise in which foreign capital participates (Fu, 2000, p.95-96). Geographer Roger Hayter argues that FDI comprises activities that are controlled and organized by firms (or groups of firms) outside of the nation in which they are headquartered and where their principal decision

makers are located. In the context of the manufacturing sector, FDI is conventionally thought of in terms of branch plant or subsidiary company operations that are controlled by parent companies based in another country (Hayter, 1997, ongoing).

In large international institutions, there are different definitions of FDI as well. The International Monetary Fund (1977) defines FDI as:

*investment that is made to acquire a lasting interest in an enterprise operating in an economy other than that of the investor, the investor's purpose being to have an effective voice in the management of the enterprise.*

While OECD's benchmark definition of FDI identifies FDI's objective is to obtain a lasting interest by a resident entity ("direct investor") in one economy other than that of the investor ("direct investment enterprise"). The lasting interest implies the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence on the management of the enterprise. Direct investment involves both the initial transaction between the two entities and all subsequent capital transactions between them and among affiliated enterprise, both incorporated and unincorporated (OECD, 1996).

Jones (1998, p.21) categorizes FDI in a different way. He distinguishes three major types of FDI as follows,

- Market-seeking – the purpose of the investment is to ensure access to the market of the destination country;
- Resource-seeking – the investment is made to ensure more reliable supplies of natural resources;
- Platform-seeking – the purpose of the investment is to provide a “platform” for production and/or sales activities in a regional market.

Hayter also points out that FDI involves issues of direct control as resources are transferred internally within firms rather than externally between independent firms. In the case of FDI, parent companies have control over both day to day operations of their investment and their nature and scope in the long run (Hayter, 1997, ongoing).

### ***FDI in China: Definition, History, and Current Conditions***

Most countries in the world permit several different forms of foreign capital participation in domestic enterprises. In China, official statistics indicate that FDI is more broadly delineated than by commonly accepted standards. According to these official publications, seven different modes of foreign capital participation are subsumed under the category of FDI. They are: contractual joint ventures, wholly foreign-owned enterprises, joint development projects, compensation trade, processing and assembly, and international leasing, with equity joint ventures arguably the most important mode of FDI in China. While the first four categories involve more in terms of

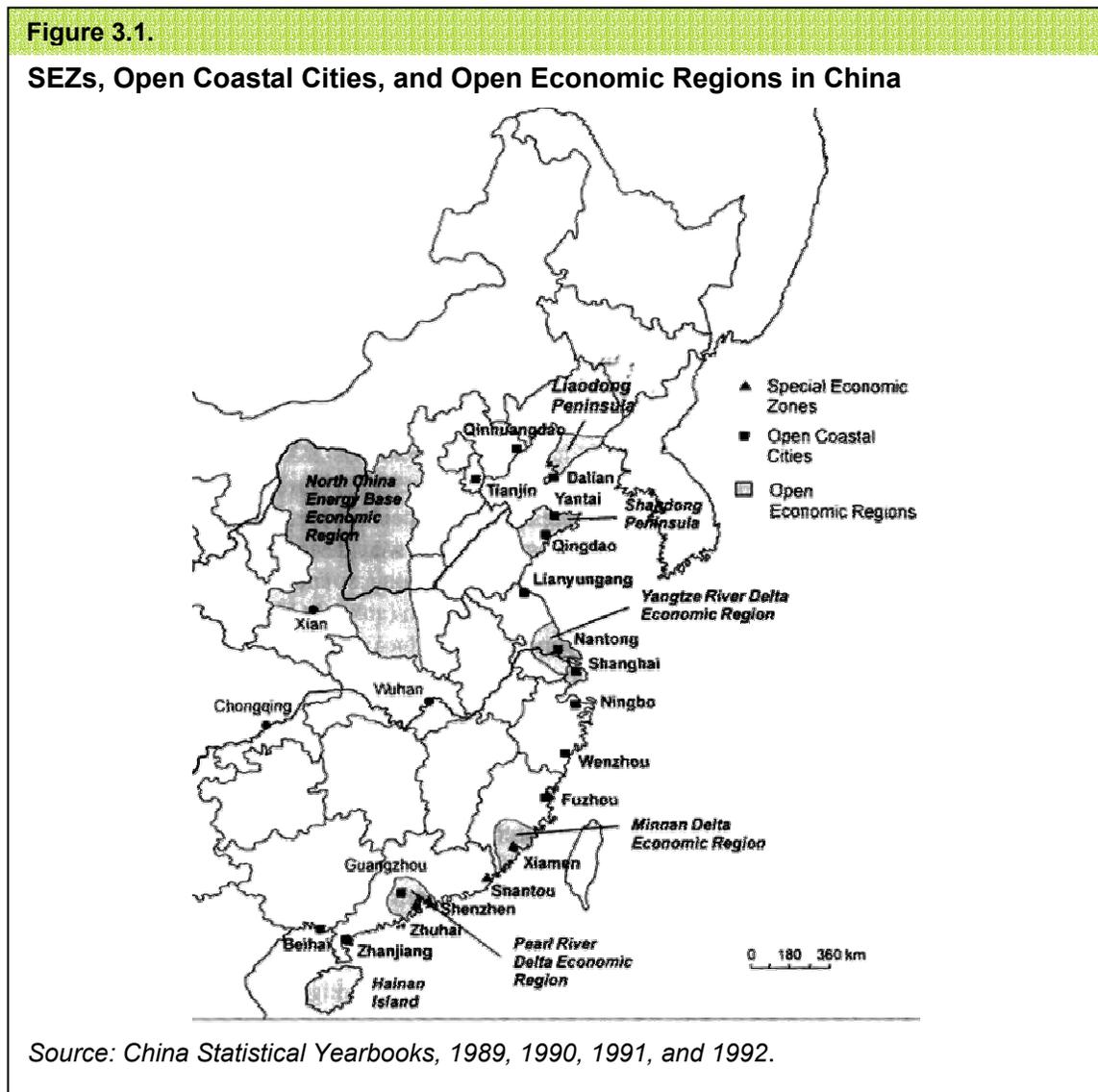
managerial control by foreign investors, the latter three modes of foreign investment are not necessarily recognized as FDI in the normal international usage of the term (Fu, 2000, p.95-97).

Since international leasing, including international loans from financial institutions such as the World Bank and foreign governments, plays a key role in infrastructure development and environmental services in China, it is included in the analysis along with FDI. Local economist Jianwu Hong (Interviews, July 2001) agrees that investments from foreign governments have been a stable source for local industrial and infrastructure development.

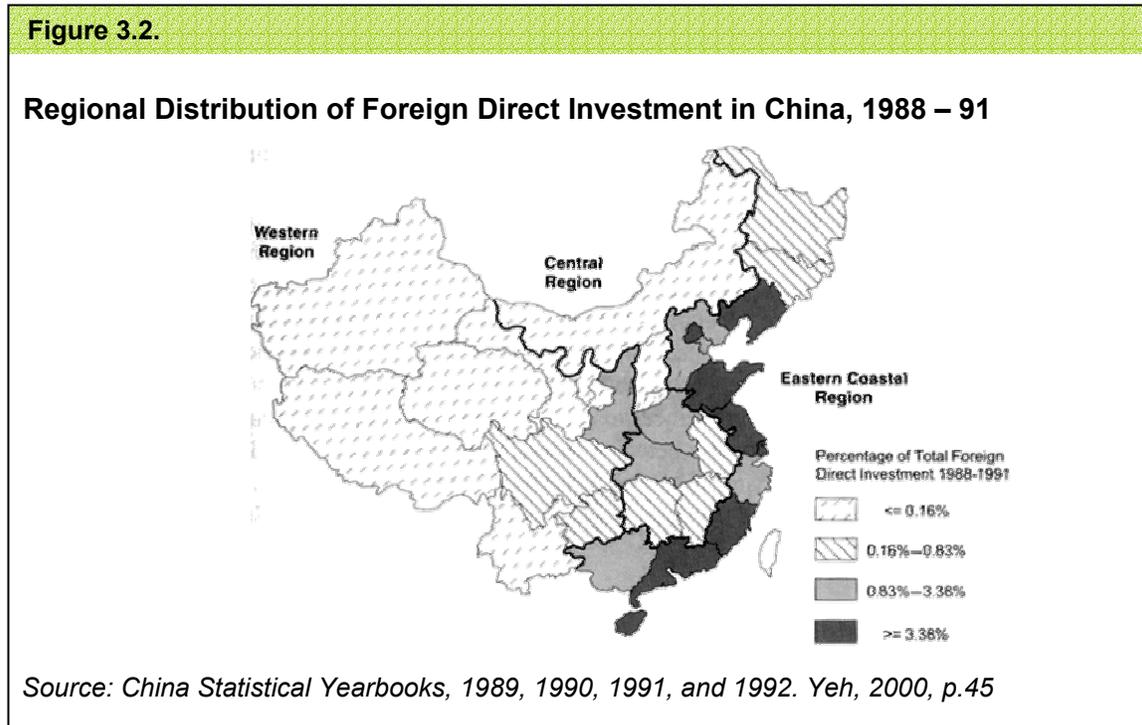
The adoption of economic reform and “open-door policy” did not happen overnight. The manner by which China implemented this policy had a very clear timeline. First, four Special Economic Zones (SEZs) were established in four cities in 1979 to attract and manage foreign investment effectively. These cities were Shenzhen, Zhuhai, Shantou, and Xiamen, of which all but the last were in Guangdong Province. The government intended to experiment with its foreign technologies and managerial skills in these SEZs. They offered many incentives to foreign investors, including tax relief, early remittances of profits, and better infrastructure facilities. The general success of the SEZs led to large-scale immigration into these cities, especially in Shenzhen.

In 1984, fourteen other coastal cities were opened for investment, two of which were from Guangdong Province, namely Guangzhou and Zhanjiang. These “open cities” offered

concessions to foreign investment similar to the SEZs, although they were not provided with the same level of central government funding for infrastructure development (Yeh, 2000, p.37). Four years later, in 1988, three special zones for foreign investment called “open economic regions” were established. They were: the Pearl River (Zhujiang) Delta Economic Region (around Guangzhou), the Yangtze River (Changjiang) Delta Economic Region (around Shanghai), and the Minnan Delta Economic Region (around Xiamen). Fig. 3.1 gives the geographic locations of the pioneer areas.



The spatial relationship between FDI and the economic hot spots also manifests itself in the more complete map Fig. 3.2 shown below. Note that the purpose of this map is to show the concentration of FDI, the percentages of provinces in the last category can be far more than 4 %.



With these continuous attempts, the Chinese government has been trying to spread the benefits of the open economic policy to more and more parts of the country, from the more accessible Southeast to the western inland. Foreign investment has relieved domestic capital supply shortage and promoted employment and economic growth (Yeh, 2000, p.37). China successfully gained membership in the WTO last year, which is viewed as another major breakthrough into the international club, following China's entry into the IMF and the World Bank in 1980 (Howell, 2000, p.177). This historical event will surely draw more attention to the China market from international investors.

Hong Kong is by far the largest investor in China. From 1979 to 1995 Hong Kong accounted for more than 80% of the utilized FDI in Guangdong, and Guangdong accounted for more than 40% of Hong Kong's investment in China (Sung, 1997, pp.47). Yeh (2000, p.45) points out that capital from firms in Hong Kong, Macau and Southeast Asian is concentrated in the SEZs and nearby Guangdong and Fujian provinces. This is largely related to geographical proximity, kinship ties, and personal contacts which seem to play an important role in the locational decisions of foreign investors. Interestingly enough, while the investments mentioned above are particularly important in the SEZs and small towns (especially in the Pearl River delta), North American and European investments are located in the large cities such as Beijing, Tianjing, and Shanghai, where urban and industrial facilities exist.

## **Urbanization and FDI**

### ***The Relationship between Urbanization and FDI***

As engines of growth, cities are becoming the focal points of global and national economies. The evolution of the economic geography of developing countries in the process of urbanization has followed an urban growth pattern that differs from that of earlier industrializing countries, which urbanized much slowly (Henderson, 2000, pp.65). The proportion of the population in urban centers increases with development (The World Bank, 1999). The prominent contributors to successful urbanization include specialization in innovative or income elastic economic sectors, favorable national government policies in such areas as investment and infrastructure, economic development leadership from either local public or private sectors, and

flexibility and openness toward new and emerging industrial ensembles (Yusuf, Wu, and Evenett, 2000, p. 7).

The effect of international trade on urbanization is well documented and understood in the literature, but not that of FDI. Since urbanization is an important factor in environmental changes, understanding how FDI has affected urbanization in the PRD area should provide insight concerning the importance of FDI in local environmental changes.

### ***China's Urbanization and FDI***

China's urban policy has shifted with the economic boom since 1979. Guang Hua Wan and Linda Wong estimate in their separate papers that the number of rural migrants into Chinese cities was around 100 million in the mid-1990s. They predict another 100 million redundant peasants by year 2000 (Wan, 1995, Wong, 1994). According to the National Construction Agency, China's urbanization level will reach 43% by 2010.

Before the profound reforms in 1979, urban development had suffered severely from a constant attack on urban commercial functions, a lack of funds for town construction, and the government's restriction on rural-urban migration (Lin, 1997, p.128). The central government administration kept population mobility very low in the pre-reform period through a system of food rationing and household registration based on an anti-urban bias. The industrial and urban centers have moved to the coastal areas since 1979, sharply different from China's post-1949 and

pre-reform urbanization because of national defense considerations that pulled population and resources away from the coastal region have faded.

The Pearl River Delta area is among those regions that benefited by this policy change. Guangdong Province has experienced both frequent immigration and internal population mobility. During the five years from 1985 to 1990, Guangdong's inter-migration and intra-migration ranked highest among all the provinces of China. The direction of migration was from neighboring provinces, inland provinces and remote mountainous areas to the Pearl River Delta, while the rural population moved toward urban areas (<http://www.unescap.org>, 2002).

There is no consensus on internationally standardized classification for urban size. In the United States, the 1990 standards that are applied to Census Bureau Data specify that an metropolitan statistical area (MSA) must include 1) at least one city with 50,000 or more inhabitants or 2) a Census Bureau-defined urbanized area of at least 50,000 inhabitants and a total metropolitan population of at least 100,000 (75,000 in New England). In addition to the county/counties that contain the largest city, an MSA also includes counties that have a large portion of their population living in the urbanized area surrounding the largest city or that meet specified commuting and metropolitan character requirements (Federal Register, Vol 55 No. 82. March 30, 1990).

The strict resident registration system in China for more than fifty years was set to control the urban population artificially. The definition of “urban” is still ambiguous Weiping Wu’s version (1997, p.451) of classification of city size in China, based on the nonagricultural population in the urban area (excluding city-administration counties), is as follows:

- Megacities = more than 1 million population
- Large cities = 0.5 – 1 million
- Medium cities = 0.2 – 0.5 million
- Small cities = under 0.2 million

However, this definition may be likely obsolete now because of the tremendous population growth in China’s urban areas. A higher number of people in each category is expected to be in the new classification system.

### **Environmental Changes and FDI**

#### ***A Global Concern***

The OECD (1999, p.3) points out that FDI has become one of the driving forces binding countries into closer economic interdependence, and it continues to expand. The rapid increase in FDI flows has generated considerable debate about its environmental implications, in particular the impacts on environmental quality in the investment of the host country. In the OECD’s 1999 “Conference on FDI and the Environment” in Netherlands, its Secretary-General, Donald Johnston, said that the debates on the environmental and other consequences of investment have sometimes been highly polarized and problematic. Some researchers are worried that countries will lower their environmental standards in order to attract foreign investment, thereby creating

so-called “pollution havens.” Others argue, to the contrary, that foreign investment could promote “pollution halos” by introducing modern, more efficient and less polluting technologies.

Bradford Gentry (1999, p. 21) supported the polarized nature of the debates by discussing two opposite positions on the FDI-Environment linkage in his speech in the above conference:

- FDI is a *bane* of environmental protection given its direct use of land and other natural resources, as well as the increased consumption it encourages; or
- FDI is a *boon* for environmental protection given the new resources it brings for improving efficiency, transferring knowledge, and addressing existing pollution.

He argued that FDI is actually both. The FDI and environment linkage can vary across locations, sectors and investors:

- Locations: (a) does the host country have a strong environmental regulatory framework in place (foreign direct investors in the US have contributed significant amounts to cleaning up contaminated sites owned by the companies they acquired); (b) is the investment in a new or an existing operation (improving the economic efficiency of existing operations can also reduce environmental loadings); or (c) is the investment in an urban or a rural setting (affecting the likelihood that sensitive sites are implicated);
- Sectors: (a) is it an environmental investment (such as in improving water systems); (b) is it in services, such as banking or telecommunications (with their less direct environmental implications); or (c) if it is in manufacturing or resource extraction, is it to establish a base

for exports (potentially exposing the company to greater environmental pressures from customers); and

- Investors: what level of environmental pressure do investors already face locally, globally and in their home countries (affecting their willingness to consider and address environmental issues as part of their investments).

Such differences are important to both the design of integrated investment and environmental frameworks, as well as to the identification of areas of potential collaboration. Gentry quotes Georgieva (1998) to the effect that efforts to integrate investment and environmental policies are helped by the growing realization that the environmental and financial crises in developing countries have shared roots and responses. Gentry is an optimistic promoter for FDI; in his conclusion he shows that only FDI can meet the need for environmental infrastructure (citation in Graham, 2000).

Does the relationship between FDI and the environment in China represent the same polemic nature as in most developing countries? The rest of this chapter explores the literature on environmental problems in China to look for evidence.

### ***China's Contribution to the Global Environment***

It is obvious to most observers that no solution to global environmental problems is possible without the involvement of China. Longtime researcher on environmental politics, Judith Shapiro (2001, p. xi) agrees that:

*China is a major force in almost every global environmental issue, be it climate change, ozone depletion, biodiversity loss, world food security, human population growth, or over-exploitation of the global commons. At the regional level, China is involved in trans-boundary air and water pollution, conflict over shared watercourses, international trade in endangered species, and cross-border fallout from nuclear weapons tests.*

We need to realize that environmental change is a continuous process that cannot be separated from a country's history. China's environment before 1949 is often described as dirty and desolate, typical of a populous nation dependent on subsistence farming in often difficult natural circumstances, with spreading deforestation, primitive technologies, and backward cities and industries. The Maoist period from 1949 to 1976, according to Smil (1984, p. xi), was presented to the Western world as a miracle period, with ever-improving farming techniques and rising yields, with cities enhanced by broad green boulevards, and with factories carefully preserving clean air and water. After the end of the Maoist era, the Chinese government finally decided to gradually unveil the truth about China's environmental image and devastating environmental problems. An unprecedented experiment of political uniformity, war preparation, and forcible relocations mobilized Chinese people to exploit nature, contrary to the old Confucian saying "humans and nature should live harmoniously as one."

The most noticeable environmental destruction ensued during the Cultural Revolution.

Smil (2000, p.192) gives a vivid example of the damages: “Believing grain harvest to be the answer to China’s problems of feeding its large population from a limited amount of farmland, the Maoist leadership ordered farmers to cut down orchards, plow up arid grasslands, fill in lakes, and cultivate just one or two grain varieties regardless of local soil and climatic conditions. This destructive wave of the late 1960s and early 1970s created more grain fields and expanded the area of cereal cultivation to record levels, but resulting yields were mostly low, and any productive benefits were outweighed by increased soil erosion, desertification, risks of flooding, and reduced variety of typical diets.”

Along with the new economic policies, environmental regulations were also first enacted in 1979. Current environmental legislation covers the management of wastewater, solid waste, and atmospheric and noise pollution; the conservation of oceans and watercourses, and the management and protection of forests, grasslands, soil, fisheries, mineral resources, water resources, wildlife, and coal and other energy resources (The World Bank, 1997b, p. 8). The National Environmental Protection Agency was established in 1988 as an independent agency to disseminate national environmental policy and regulation, collect environmental data from local environmental protection bureaus and provide training and administrative support to them, and provide technical and policy advice to the provincial environmental protection commissions on both national and international environmental issues.

However, as in many countries, monitoring and enforcement of environmental laws must

take place at the local level to be successful. Local governments face a tradeoff between protecting the environment and safeguarding the financial and employment performance of local firms. Meanwhile, competition between local governments for more significant foreign investment occurs at all levels. As the Central Government has eased its control over the local governments, the environmental protection agencies have undertaken more responsibilities. Numerous small environmental cases are negotiated directly at the local level. Some World Bank professionals (The World Bank, 1997b, p.8) argue it is because it is more efficient and because of the traditional Chinese disdain for legal or administrative arbitration. It is my view that, due to the large territory and diverse situations of the environment in China, the local municipalities are inevitably the ones who must be responsible for most of the monitoring and law enforcement.

Without a doubt, China is undergoing rapid industrialization and urbanization. With 22% of the world's population living on only 7% of the world's arable land, China's per capita resource base is unusually low. According to a survey conducted by the Research Center for Environment and Development for the Chinese Academy of Social Sciences, economic losses in China arising from the impacts of pollution in the period 1986-1996 totaled US\$12 billion/year (International Environment Reporter, December 11<sup>th</sup>, 1996, p.1119). To a country with a GDP per capita around US\$2,500, the consequence of pollution would place a growing burden on the national economy.

China's National Environmental Protection Agency (NEPA, 1993) identifies several

environmental priorities that are likely to have long-term impacts on ecosystems and the economy:

- Water pollution
- Water shortages in urban and northern China
- Urban air pollution
- Industrial toxic and hazardous wastes
- Soil erosion
- Forest and grassland degradation
- Habitat destruction and species loss.

In this paper's analysis, air and water quality must be given specific attention among all the environmental problems in China, because of their strategic importance, as follows:

### ***Urban Air Pollution***

China's air pollution problems may be attributed to the country's energy dependence on coal and rapid growth in automobile possession. It is exacerbated by the poor quality of the fuel and low efficiency of its combustion. Before 1980 China ranked as the world's third largest producer of coal, following the USA and the former USSR. However, the post-1980 economic boom pushed China into first place. China extracted more than 1.2 billion tons in 1995 of coal (Smil, 2000, p.192).

Air pollution in China is discussed in this paper in two parts: emissions of major air pollutants and ambient air quality. The following descriptions and data are based on national environmental statistical data.

(1) Emissions of major air pollutants

- Waste Gas. Waste gas emissions show the possibility of air pollutant emission and the likely air pollution pressure. Some scientists argue from a fiscal point of view that in some sense, it can also show the burden that the treatment of waste gas may cause. The actual amount of air pollutants emitted depends upon not only on the volume but also the treatment efficiency of waste gas (Zou and Yuan, 1997, p121). In general, there is a close direct relationship between the total amount of waste gas emitted and quantities of fuel and raw materials used. Waste gas includes the emissions of sulfur dioxide, smoke dust, and Industrial Solid Particulate Matter (ISPM).
- Industrial Solid Particulate Matter (ISPM). Its emission has decreased substantially, from 14.42 million tons in 1981 to 6.30 million tons in 1995 (it is measured by weight instead of cubicle meters like other components in air pollution). This can be attributed to the rising of energy consumption level and effective ISPM control policy.
- Smoke Dust. The emissions have fluctuated over time. They decreased between 1983-84 and 1989-91 and increased between 1985-88 and 1992-94.
- Sulphur Dioxide (SO<sub>2</sub>). The industrial sector comprising electric power generation, steam and hot water production and supply is the major contributor to SO<sub>2</sub> emissions in China.

- Carbon Dioxide (CO<sub>2</sub>). Emissions of carbon dioxide, derived from China's fossil fuel combustion, cement production, and gas flaring, accounted for 11% of the world's total in 1991 and ranked third after the United States (22%) and the former Soviet Union (16%). However, China's emissions per capita of carbon dioxide is only 11% of the United States', 18% of the former Soviet Union's, and 25% of Japan's (Zou and Yuan, 1997, p122).

## (2) Ambient air quality

- Total Suspended Particulates (TSP). This indicator is a significant measure of the ambient air quality in the cities. The data from the National Environmental Protection Agency (1990~1995) show that the annual-daily average of TSP for the city with the highest concentration dropped from 2,770 g/m<sup>3</sup> in 1981 to 732 g/m<sup>3</sup> in 1995. This implies that the ambient air quality in the cities with the most serious dust pollution has considerably improved.
- Sulphur Dioxide (SO<sub>2</sub>). The annual-daily averages of sulphur dioxide concentration, as an indicator of ambient air quality for the main cities in China, have not improved significantly since 1980.
- Nitrogen Oxides (NO<sub>x</sub>). Guangzhou, along with Beijing, is among the most seriously polluted cities with a very high annual-daily average concentration of nitrogen oxides. A review from the China's National Environmental Protection Agency in 1990~95, concerning the annual-daily average of nitrogen oxides concentration in the sampled southern and northern cities, shows that the measured concentrations were in the range

of 40 - 60 g/m<sup>3</sup> and have not improved during the period 1981 – 95. The situation is linked to the rapid increase in motor vehicle use in these cities. The number of private motor vehicles rose from 1.78 million in 1980 to 9.42 million in 1994 (State Statistics Bureau, 1995). It is likely to further increase in the future (Zou and Yuan, 1997, p. 121-123).

### ***Water Quality in Focus***

Water pollution, a focus of recent Chinese policy, has contaminated 52 of 135 monitored urban river sections throughout China (the World Bank, 1997b, p2). This pollution does not meet even the lowest standards necessary for irrigation water. A large amount of untreated wastewater is discharged directly into water bodies, causing pollution in varying severity in all large rivers in China. Nationwide, municipal waste accounts for about 40% of wastewater discharges; industry contributes the rest (the World Bank, 1997, p.11). It becomes clear that China must persuade the market to work for the environment, not against it. Although much has been achieved in preventing water pollution through the establishment and implementation of water pollution charges/penalties, water pollution is still very serious and there are many problems to be overcome to ensure that water resources are adequately protected.

Water pollution exacerbates the shortage of quality water resources available in China, and has direct effects on the lives of people and on economic development. In 1995, the total amount of wastewater discharged in China (not including that of township and village enterprises)

was 35.62 billion tons. Of this, 22.25 billion tons was industrial wastewater, and increase of 3.2% from 1994. Measurements of Chemical Oxide Density (COD), heavy metals, Arsenic (As), volatile phenol and petrol indicated increases of 13.1%, 7.4%, 4.4%, 17.0%, and 15.4%, respectively. Only barely over half of the industrial wastewater discharged met the established standards while the treatment rate for municipal wastewater was less than 10% (Zhang, Wang, Wu, Wang, 1997, p.248).

Since the 1980s, the implementation of a water pollution charge consistent with the polluter-pays principle has been a basic component of water resource management policies and regulations in China. It has proven to be an effective policy instrument, particularly in its active role in stimulating enterprises to control water pollution, improve water quality, strengthen business management practices, and use water efficiently.

### ***China's Environment and FDI***

China as a host country has a relatively new environmental regulation framework. FDI came in as fresh blood to expand China's originally weak industrial base. Most FDI locates in the manufacturing industry in rural areas other than in urban settings in the PRD. Unique to China and the PRD area, their biggest investor, Hong Kong, has a very close tie with the mainland economically as well as politically. The impact of FDI on environment in China has its special characters that are worth further observation. Theoretical models and analysis will be presented in the following chapters.