Senior Thesis;

Effects of Foreign Direct Investment on Chinese economy

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I. Introduction

China has been the second largest recipient of foreign direct investment (FDI) in the world since 1993. By the early 1990s, China was already attracting almost one fourth of the total FDI inflows to developing countries (World Bank, 2004). United Nations Commission of Trade and Development (2002) reports that foreign-invested firms account for 23 percent of China's total industrial value-added. Moreover, FDI is responsible for 18 percent of national tax revenue and about 50 percent of total exports in China as of 2001.

Since China's opening up to the world in 1979, FDI has played a central role in the progressive transition of China from a closed command economy towards an open market economy. Providing foreign capital and introducing new technologies and management skills, FDI is often viewed as a positive factor for China's economic development. On the other hand, others argue that FDI is more detrimental than beneficial to Chinese economy by accumulating foreign debt and widening unequal income distribution.

In an attempt to address such a controversial issue around FDI in China, this paper studies the impact of FDI on Chinese economy. We find that FDI is a positive contributor to China's economic growth while it certainly generates some undesirable consequences to the economy. The paper is organized as follows. Section II describes the expansion path, distribution and sources of FDI in China. Section III presents two theoretical models of FDI and analyzes the determinants and strategies of FDI in China. Section IV discusses how FDI contributes to economic growth by promoting domestic investment, productivity growth and trade performance while Section V examines negative impacts of FDI on Chinese economy. This paper concludes by summarizing major findings and suggesting policy implications.

II. Expansion, Distribution and Sources of FDI in China

Since China opened its door to world economy in 1979, the realized value of foreign direct investment inflows has grown from virtually non-existent to approximately $527 million in 2002 (Xiaojuan, 2004). Table 1.1 records the expansion of the realized value of FDI stock in China from 1979 to 2002. The expansion trajectory of China's FDI inflows reflects the evolution of FDI-related policies and laws as the institutional framework of China's FDI regulation.

The period of 1979-82 experienced a rapid expansion of FDI inflows at an average annual rate of 62.8%. Such a high growth rate was initiated in 1979 when National People's Congress of China set up a legal framework for permitting foreign investors to form equity joint ventures with Chinese partners. Rapid FDI expansion continued in early 1980s, reflecting China's preferential treatments for FDI in designated special economic zones and "open cities" in southeast coastal regions (Zhang, 1999). On the other hand, the period of 1987-90 records a relatively sluggish growth because China still represented for many potential foreign investors a country of a lengthy process of bureaucratic approval, uncertain property rights and outdated communication and transport system. However, China experienced a remarkable expansion of FDI inflows in early 1990s, during which FDI grew at an average annual rate of 87.5%. This can be explained by a series of reforms that gradually removed sectoral restrictions on FDI in real estate, retailing and banking as well as by the legislation of auxiliary regulations to clarify tax incentives and management autonomy (Fu, 1999). Also, we can expect that the rapid FDI expansion in early 1990s was the lagged effect of permitting wholly foreign-owned enterprises in 1986.

Since the mid-1990s, FDI inflows have been increasing steadily but at a much decelerated rate. This slowdown in the rate of FDI flows in recent years can be explained in light of the role of FDI as a source of foreign capital to finance capital formation in China. When investment spending exceeds domestic savings level at a given period of time, the economy can import capital to finance the excess investment expenditures and register a current account deficit. Yet, Table 3.4 shows that China records a trade surplus from 1994 to 2002. Considering that trade balance is a close approximation of current account, we can deduce that China has had positive domestic net savings since 1994. That is, there has been an excess level of domestic savings in China relative to its investment expenditures. This indicates that domestic savings level is more than sufficient to finance investment demand in China. Accordingly, there is little theoretical justification for FDI to supply foreign capital and finance China's investment expenditures except for reasons associated with technological and managerial skills embedded in FDI.

The slowdown in the rate of FDI inflows may also reflect the unfavorable environment for investment in the face of the Asian financial crisis in 1997-8 and the following world-wide recession. In fact, FDI inflows fall by 13 percent from $45.5 billion in 1998 to $40.3 billion in 1999 (Xiaojuan, 2004). Meanwhile, Fung, Lau and Lee (2004) suggest that this slowdown in FDI inflows may continue in the near future because China projects to reduce its industrial tariffs to an average rate of 9.4% by 2005 according to its bilateral WTO agreement with U.S. Although China's WTO accession in 2001 entailed various liberating measures on local-content requirements and service sectors with regards to FDI, China's commitment to major tariff reductions would reduce the incentive for foreign investors to locate in China simply to avoid paying the high tariff rates. Since exporting is an alternative mode of entry to China, lower tariff rates on exports raises the opportunity cost of FDI to the foreign investors.

Table 1.2 presents the industrial distribution of cumulative FDI in China as of 2000. Approximately half of FDI flows into the relatively technology-intensive electronic and telecommunications industry. About 10 percent of FDI is found in metal products industry, 8.9 percent in garments & fiber products and 8.16 percent in plastic industry. In the remaining industries, FDI is more or less evenly distributed.

Table 1.3 presents the sectoral distribution of cumulative FDI in 2002. Industry (62.14 %) and Property & Utilities (22.66%) stand out as the top two sectors with the highest share of contractual FDI value in 2002. Reflecting that China is a socialist country, less than 1 percent of total FDI flows to sectors such as education, arts, broadcasting and social welfare that may have cultural and political strategic importance. That "scientific research & technical services" sector receives only 0.37 percent of China's total FDI inflows suggests that FDI does not participate actively in upgrading China's technological capability.

Meanwhile, the geographical distribution of FDI in China is noteworthy. Table 1.4 shows that the share of FDI in the eastern coastal region surpasses the combined share of central and western regions by an outstanding difference. About 86 percent of the realized FDI value was channeled to the eastern coastal region whereas only about 14 percent found its way to the rest of China in 2001.

Table 1.5 lists the top 15 foreign investors in China as of 2002. The table suggests the geographical proximity as an important determinant of FDI, given that more than 70% of China's FDI flows from neighboring Asian countries. In particular, Hong Kong is the single largest investor in China with its share nearing 46%.

III. Determinants of FDI in China

Different factors determine the level of FDI in a developing economy. The market size and its potential growth motivate multinational corporations to take advantage of unmet demands in a developing economy. On the other hand, FDI intends to improve its profit margin and increase international competitiveness by benefiting from low production costs of the host country. In addition to these economic factors, institutional framework that provides favorable legal system and incentive policies is an important determinant of FDI. Other determinants include geographical proximity, linguistic and cultural familiarities and personal ties. In this section, we analyze some motives and strategies of FDI that shed light on its potential impacts on the host country.

3.1. Two alternative models of FDI for a developing economy

Whether FDI benefits more than harms the host economy is a contentious matter. Moran (1998) introduces two alternative models that conceptualize the impact of FDI on a developing host economy based on the overriding motivation of the foreign investor.

One of the two is a welfare-promoting framework, what Kojima (1978) calls an "expansionary type." According to this model, a foreign firm invests in a developing country for the size and potential growth of its market. Once a firm satiates domestic market with the existing technology and design embedded in its products, it is motivated to serve a foreign market and expand its total market share.

As much as the foreign firm benefits from the surging new demands for its products, the host economy experiences a reciprocal gain in the form of an increase in employment opportunities for the labor force. As more jobs are created, consumption spending will rise, thereby triggering the multiplier effect of output expansion. Besides, FDI serves as a source of technological, managerial and marketing skills that local enterprises can learn and assimilate. In other words, foreign investors can potentially upgrade technology and improve production efficiency of relevant local industries and firms. This productivity growth would shift outward the economy's production function and cause a permanent increase in output growth rate.

FDI can also be welfare-promoting to the host economy by bringing in additional supply of capital and by demanding additional labor force. Under the assumptions of diminishing returns and perfect labor market, this phenomenon would lower relative returns to capital and raise labor-market returns to workers, thereby bringing about a less unequal income distribution in the developing economy. As the workers' purchasing power increases, we can further anticipate social development in the form of improved educational and health services.

In addition, Moran (1998) constructs a "benign" model that Kojima (1978) calls a "defensive type" of FDI. According to this model, FDI deteriorates rather than promotes economic welfare of the host country. For firms to operate abroad, they need to possess some advantages over their local competitors in the form of technology license, proprietary rights or economies of scale that offset disadvantages of incurring transportation costs and all the other costs associated with operating abroad. This implies that firms are prone to create imperfect competition in their overseas market.

Foreign firms can adversely affect the local market by investing in capital-intensive industries with "inappropriate" technology that creates barriers to entry for local firms. If the foreign technology is inappropriate for the developmental stage of the host economy, domestic firms and industries have little or no access to advanced technology introduced by FDI. Given that FDI does not promote technology learning in the host economy but primarily gains market power at the expense of the less competitive domestic firms, foreign-invested enterprises (FIEs) may reap profits while reducing the welfare of domestic consumers with higher prices. If FIEs' profitability is substantial enough to adversely affect the welfare of consumers and local producers, FDI may be more detrimental than beneficial for the development of the host economy.

Foreign direct investment in labor-intensive industries may also suppress China's economic development. In order to enhance their international competitiveness, foreign firms may abuse their market power and exploit low-skilled cheap labor inputs of the developing country. Using China as the low-cost manufacturing base for exports, FDI creates jobs in the host economy, but it would rarely transfer advanced technology nor would it raise human capital for a sustained economic development.

These two alternative models are not mutually exclusive in real world. In fact, the benign and malign models of FDI are intertwined because FDI behavior is determined by a set of multiple motifs rather than by a single factor that unequivocally leads to either a negative or a positive impact on the host economy. Yet, these two models serve as an analytical framework for understanding the economic impact of FDI inflows to mainland China.

3.2 Motivations and strategies of FDI

In this sub-section, we examine the potential impact on Chinese economy of various motivations and strategies of FDI along three axes. First axis revolves around the targeting market of FDI. Foreign-invested enterprises may use China as their export processing base to become more competitive in world market. The strategy of their investment is to relocate their production operations to China in order to exploit the abundant, cheap labor force as well as the vast land. On the other hand, FDI may intend to primarily meet unsatisfied market demands in China. If foreign-invested firms are domestic-market oriented rather than export-market oriented, they integrate China as one of their markets to serve with their products (Chung, 1996). In light of the two theoretical models outlined in 3.1, market integration strategy of FDI is to be preferred to the production relocation strategy for promoting China's economic welfare.

In 1997, Korea Research Institute for Human Settlements (KRIHS) surveyed 65 Korean firms located in Shandong province to ask for the most important reason(s) for investing in the region. According to the survey results, 52.3% responded to the "cheap labor" as their primary investment determinant whereas only 10.8% of firms responded to be motivated primarily by gaining access to Chinese market (Park and Lee, 2003). Although the data of this regional survey are too limited to conclude that Korea's direct investment is more detrimental than beneficial to Chinese economy, it serves as an empirical indicator of the export-oriented Korea's direct investment to China. Due to the rising wages and appreciating currency at home since late 1980s, Korea's labor-intensive and export-oriented industries were losing their international competitiveness. To reverse their declining profits, some Korean firms moved their production base to China (Kim, 1995). In fact, Park and Lee (2003) confirm Korea's export-oriented

strategy in China when they compare export/production ratios of FDI in Shandong province from Korea, Hong Kong and U.S. in 1995. They find that FDI from Korea has the highest export to production ratio at 93.1 percent while Hong Kong and U.S. have much more moderate ratios of 35.1 percent and 31.5 percent respectively.

The second axis of our examination of FDI involves the degree of linkages between foreign firms and Chinese local firms. By supplying advanced capital goods and intermediate inputs to local users in downstream industries, foreign-invested enterprises form forward linkages with local firms and pass on their competitiveness through price reductions and superior products. Meanwhile, when FDI uses local goods and services as their intermediate inputs to the production, FDI forms backward linkages with local suppliers in upstream industries. Growth-oriented policy makers in China are more interested in backward linkage effects than forward ones; the former reflects the total increase in national output in response to the increase in final demand for FDI products in addition to the intangible positive externalities associated with technology transfer and efficiency improvement when FDI trains local workers, requires certain product standards to local suppliers and generates more competition in upstream industries (Sun, 1996).

Due to the data limitations for examining forward linkages as well as their relative irrelevance in policymaking from the demand side of the economy, we focus on the backward linkages that FDI forms with the local firms in China. Since foreign investors have a choice between importing inputs and using local inputs, the local content of inputs used in the production by FIEs is an important estimator of the extent to which the backward linkage effects

have been realized in China. Table 2.1[1] shows that the selected twelve industries all have a larger share of local content than imported content in intermediate inputs. This indicates that FIEs in selected industries used more local inputs than imported inputs in 1992 and, in turn, suggests that they formed relatively high backward linkages with local suppliers.

To examine whether their linkages with local firms have a positive effect on Chinese economy, we need to compare the export/output ratio of a FIE with its imported input content because FDI is involved in both exporting and importing of the host economy. If a FIE exports more than it imports, an increase in its exports would not only expand local production through linkages effects but also improve the trade balance of the host economy. On the other hand, if a FIE imports more than it exports, the increase in local production as a result of an increase in FDI-led exports may be offset by the trade deficit associated with FDI-led imports. In this case, the overall impact of FDI on China's national output is ambiguous.

Table 2.1 shows all but the FIEs in metal smelting and transport equipment industries to have a higher export/output ratio than the imported input content. FDI in metal smelting and transport equipment has a higher imported input content than export/output ratio less because of its low linkages with local firms than because of its domestic-orientation associated with infrastructure provision to China. In the remaining ten industries, FDI-led exports as a share of output exceed FDI-led imports as a share of total inputs. This suggests that FIEs' linkages with the local firms in the ten industries promote output expansion without adversely affecting trade balance.

Meanwhile, Dunning (1993) claims that export-oriented FDI firms tend to have weaker linkages with local firms than domestic market-seeking FDI firms do. Foreign-invested

[1] Due to the time constraint of obtaining more recent industry-specific data, Table 2.1 dates to more than 12 years from now, 1992. Although the Table is not updated, it serves our present purpose of analyzing linkage effects.

enterprises that relocate their production to China for its cheap resources are more likely to use less expensive imports as their intermediate inputs than those whose focus is to serve China's domestic market. Over and above the local-content requirements imposed by the host country, domestic market-seeking FIEs have a greater propensity to make market transactions with local firms and industries than export-driven FEIs. Whereas the latter would purchase local inputs only when they have price competitiveness over imported inputs, the former expects intangible returns to using local inputs in the form of better knowledge of local tastes and preferences in technology and design.

Dunning's claim is supported by Korea Institute for International Economic Policy. The latter finds in its 1992 survey that, on average, Korean FDI firms import from Korea 85.1% of their machinery and production equipments and 91.9% of their raw materials. Moreover, KRIHS finds in its 1997 survey that 70.3% of Korean firms in Shandong claim to have imported over 70% of their production parts from Korea (Park and Lee, 2003). Both surveys suggest that Korea's export-oriented direct investments in China are associated with the low level of backward linkages they make with local Chinese suppliers.

The sectoral distribution of FDI is the third axis that classifies different motives and strategies of FDI in China. Park and Lee (2003) hypothesize that export-market oriented FIEs tend to invest in labor-intensive sectors while domestic-market oriented FIEs tend to invest in capital-intensive sectors. This hypothesis is theoretically valid, considering that China is capital scarce and labor abundant in its relative factor endowments; domestic-market oriented enterprises would gain higher rates of return to investing in a capital-intensive sector than investing in a labor-intensive sector whereas export-market oriented enterprises would take the

cost advantage of abundant labor. Table 2.2 lends empirical support to this hypothesis, showing that Korea's export-oriented FDI in Shandong has substantially lower capital/labor ratios than the investments flowing from Hong Kong and U.S.

Direct foreign investments in capital-intensive sectors create positive externalities to Chinese economy. Whereas investments in labor-intensive sectors transfer little or no foreign technologies, capital-intensive investments may trigger productivity growth as China acquires technologies embodied in and management skills associated with foreign capital. Relative to its Asian investors, U.S. firms invest heavily in capital-intensive sectors such as aviation, automobiles, computers and chemicals. Shanghai Foxboro Company Ltd., the first Sino-U.S. joint venture in high technology, doubled its profits in its second year of operation in China, 1986 (Zhongli and Yi,1995). In addition to this empirical evidence of high returns to capital, FDI in capital-intensive sectors create "demonstration effects" to other sectors of the economy. For example, China undertook management reforms of its 19 state-owned enterprises (SOEs) in 1991 in an explicit reference to the exemplary management system of Sino-U.S. joint-ventures. By acquiring foreign management know-how, the total industrial production and sales revenue of these SOEs grew by 12.4% and 22.5% respectively in the first eight months of 1992 (Zhongli and Yi, 1995).

IV. FDI and Economic Growth

Figure 3.1 shows that national income starts to expand at an accelerated pace after 1978, the very year when China formally adopts its "open-door" policy. Compared to the average annual GDP growth rate of 5.2% in 1960s and 5.8% in 1970s, China records a much higher growth rate of 9.7% in 1980s (Chen and al., 1995). This coincidence between FDI inflows and accelerated economic expansion in 1980s calls for a statistical test to investigate any systematic correlation between FDI and income growth.

Using annual data from China Statistical Yearbook (2002) for the period of 1983-2001, I regress per capita real GDP on four explanatory variables; domestic investment, foreign direct investment, foreign capital other than FDI and a time variable to account for the time trend inherent in GDP growth. The regression results in Figure 3.2 show that FDI is a statistically significant contributor to output expansion; the estimated elasticity coefficient on "ln FDIt" denotes a 0.137 percent increase in per capita real GDP in time t associated with a one percent increase in FDI inflows in time t. On the other hand, foreign capital other than FDI is found to have no impact on economic growth. Moreover, China's domestic investment during this period is not a statistically significant determinant of GDP growth, although the corresponding coefficient has a positive sign. This may be attributable to the data constraints, in which case the sample size is too small to make a precise estimation of the statistical correlation between domestic investment and output growth. Or, domestic investment may not have been productive enough to show a systematic link between capital formation and income expansion during the period of 1983-2001.

Recognizing the potential simultaneity problem in the model, I regress real GDP per capita on one-year lagged values of domestic investment, FDI, and non-FDI foreign capital using the same data sample. The regression results in Figure 3.3 illustrate that the lagged impact of FDI on China's economic growth is larger than its contemporaneous impact; a one percent increase in FDI has a lagged impact of a 0.233 percent increase in per capita real GDP, whereas a one percent increase in FDI has a contemporaneous impact of a 0.137 percent increase in per capita real GDP. Besides, foreign capital other than FDI has a statistically significant lagged impact on GDP level; a one percent increase in non-FDI foreign capital deteriorates per capita real GDP by a 0.105 percent. However, domestic investment lagged by a year is not associated with a statistically significant income expansion.

The regression results in Figure 3.2 and 3.3 demonstrate the statistical importance of FDI inflows as opposed to other forms of foreign capital and domestic investment in promoting China's economic growth during the period of 1983-2001. In fact, Xiaojuan (2004) finds that foreign-invested enterprises contributed 1.9 percentage points to the 7.3% growth of the Chinese GDP in 2001. In this section, we discuss theoretical frameworks and examine empirical evidence to account for the positive effect of FDI on China's economic growth. We also suggest policy implications wherever applicable.

4.1 Theoretical discussion of the effect of FDI on economic growth

There are several channels through which FDI can promote economic growth. First of all, FDI raises employment rate by either creating new jobs directly or using local inputs. As long as

the additional demand for labor does not cause inflationary pressures to the economy, FDI may successfully push output level to its potential capacity while raising consumers' purchasing power with higher wage rates.

As a source of foreign capital inflows for the host economy, FDI can augment the economy's total financial resources available for investment. By providing infrastructure, equipments and technology that cannot be made locally, FDI also creates new opportunities for domestic investment (Atri and Jhun, 1990). In particular, FDI is prone to stimulate local investment spending when it takes the form of joint ventures with local firms. In all cases, FDI contributes to total capital formation of the host economy and promote output expansion.

Foreign direct investment from a developed country allows local firms and industries in the less developed recipient country to gain access to advanced technologies, efficient management practices and innovative marketing skills used by foreigners. Acquiring technological capabilities and management efficiency, local firms can raise marginal productivity of their capital stock with more efficient utilization of resources. On a macroeconomic level, FDI would increase the efficiency with which the factors of production are combined to produce national output.

Besides, the host economy benefits from import and export activities of foreign-invested enterprises. Not only does their potential trade surplus translate into a positive component of aggregate expenditures, but FDI-led trade performance gives the host economy access to international markets and expose it to a greater degree of international competition which would, in the long run, increase the competitiveness of local firms and industries.

In the rest of this section, we analyze the empirical evidence of domestic investment, productivity growth and net export growth as three main, although not exclusive, channels through which FDI contributes to China's economic growth.

4.2 FDI and domestic investment

The contribution of direct foreign investment to the total capital formation of China has become increasingly important. Table 3.1 shows that FDI has been taking consistently more than 10 percent share of total fixed capital investment in China since 1993. As a determinant of output level, capital accumulation has high rates of return to the economic growth of a developing country. While FDI contributes to total capital formation of the host economy unambiguously, it is important to examine if FDI substitutes, rather than supplements, potential domestic investment. The relationship between FDI and domestic investment has been the focus of many empirical studies. According to Atri and Jhun (1990), FDI stimulates domestic investment in the host country, whereas Warwick (1991) finds that FDI in developing countries crowds out partially domestic investment when foreign firms claim use of scarce physical and financial resources available to local firms.

In order to test the effect of FDI on China's domestic investment, Sun (1998) conducts a regression analysis using data for ten coastal provinces over the period of 1983-95. Domestic investment is primarily financed by domestic savings level which, in turn, is determined by disposable income per capita. Besides, foreign capital inflows including FDI and other forms of

foreign capital can be used to finance domestic investment. Thus, this time-series and cross-sectional model regresses domestic investment on income per capital, foreign direct investment and foreign capital other than FDI.

Figure 3.4 shows the estimated elasticity coefficients of the regression equation. The coefficient on "ln FDI" denotes that a one percent increase in FDI would cause approximately a 0.12 percent increase in domestic investment. Not only does FDI have a positive impact on domestic investment, but the t-ratio of the coefficient indicates that the impact is statistically significant. Meanwhile, domestic savings, represented by income per capital, has the largest positive impact on domestic investment; the estimated coefficient on "ln YPC" indicates a 0.80 percent increase in domestic investment as the result of a one percent increase in per capita income. The coefficient on "ln FK" denotes a positive but statistically insignificant impact of other forms of foreign investment on domestic investment.

As an extension to this regression run by Sun (1998), I update the data sample to cover the period of 1983-2001. Due to the difficulties of obtaining province-level data, I use the model developed by Sun (1998) to conduct a time-series regression of domestic investment on income per capita, foreign direct investment and other forms of foreign capital. The estimated coefficient on the FDI variable in Figure 3.5 shows that a one percent increase in FDI results in a 0.05 percent decrease in domestic investment. In other words, FDI substitutes domestic investment in a systematic way between 1983 and 2001. On the other hand, FDI is found to supplement domestic investment when the latter is regressed on the lagged value of the independent variables. According to the regression results in Figure 3.6, FDI has a statistically significant lagged impact on domestic investment; the estimated coefficient on "ln FDIt-1" indicates that a one percent increase in FDI results in a 0.05 percent increase in domestic investment.

Why would FDI complement rather than substitute domestic investment? Firstly, foreign capital participation through joint ventures provides new investment opportunities as foreign partners transfer technology, management and marketing skills to local partners. Also, domestic investment projects may require financial and physical resources as well as advanced technology that may be difficult to obtain without foreign investments. Secondly, FDI can facilitate domestic investment by undertaking infrastructure projects such as airports, power stations, highways and telecommunication facilities, all of which would substantially improve the investment environment and thus encourage domestic investment.

4.3 FDI and productivity growth

Economic growth is not only driven by factor accumulation but also by the total factor productivity growth (TFP), a measure of the change in output as a result of an aggregate change in all production factors of the economy. The effectiveness with which factor inputs are combined would depend on the technological capability and the efficiency of resource allocation in the economy. Given the diminishing returns to factor accumulation in the long run, enhancing total factor productivity is imperative for a sustainable economic growth. In addition, endogenous growth theories explain that labor and capital productivities can be significantly enhanced by an improvement in total factor productivity (Ray, 1998).

In this sub-section, we examine the impact of FDI on the productivity growth of China. We hypothesize that FDI does not only contribute to China's capital formation, but it also represents a transfer of a package of advanced technology and management skills from the investing

country to China. Liu and Wang (2003) present three theories to explain the relationship between FDI and productivity. "Industrial organization theories" state that foreign-invested enterprises contribute to the industry-level productivity by intensifying competition, demonstrating and diffusing their knowledge. According to "International trade theories," firms that choose to directly invest overseas create more positive externalities in the host country than if they were to opt for other alternative entry modes, namely, exporting and licensing. Lastly, "Endogenous growth theories" argue that FDI is an important source of human capital augmentation and technological progress, both of which enhance the productivity of the host economy.

Liu and Wang (2003) conduct a multiple regression analysis to study the impact of FDI on total factor productivity. Their study is performed on a cross-sectional sample of 189 Chinese industrial sectors using data from a survey conducted by State Statistical Bureau of China in 1995. Liu and Wang create a regression model in which TFP is a function of the level of R&D expenditure, FDI, human capital and economies of scale. While FDI is the variable of main interest in this study, R&D is included in the model because it represents a deliberate effort to accumulate technological capability and thus raise the productivity of the economy. Human capital embodies the ability to absorb advanced technology whereas economies of scale are expected to increase production efficiency of the industry.

The regression results in Table 3.2 show that all the independent variables have a positive impact on TFP while human capital in itself is found to have no statistically significant role in promoting productivity. The estimated coefficient on "ln RFDI" with its significant t-statistics indicates a 0.16 percent increase in TFP associated with a one percent increase in the ratio of FDI to total capital in the sector. Using cross-sectional industry-level data, Liu and Wang give

empirical evidence that FDI has a statistically significant positive effect on TFP. This suggests that FDI inflow is not merely a source of capital formation but also a conduit for technology transfer and efficiency improvement.

In order to examine the impact of FDI on the productivity level, Zhang (2002) regresses economic growth on three production factors using a panel data sample of 28 Chinese provinces during the period of 1984-1997. In an attempt to isolate the effect of productivity-promoting FDI on economic growth, Zhang incorporates FDI as a factor of production along with physical and human capital in a Cobb-Douglas production function. Thus, the estimated coefficient on FDI variable would be interpreted as the portion of its contribution to output growth that is not attributable to physical and human capital accumulation. The coefficient captures essentially the rate of technological progress and the improvement in management skills that are associated with FDI.

Ninety seven percent of China's growth is explained by this model, that is, by the accumulation of physical and human capital and FDI inflows (Table 3.3). However, the estimated coefficient on FDI indicates that the variable does not have a statistically significant impact on economic growth. This suggests that FDI does not have any systematic contribution to China's productivity growth. Lack of technology transfer and efficiency spillover effects can be explained by the weak linkages between FDI and local firms (Zheng and al., 2004). Also, the relatively high concentration of FDI in labor-intensive, export processing production would limit the spillover effects of advanced technology and management practices from foreign to domestic firms.

Meanwhile, Zhang further investigates the contribution of FDI to economic growth in 18 selected cities. Table 3.4 shows that FDI is a significant determinant of economic growth only in 6 cities located in coastal and metropolitan areas; Beijing, Fujian, Guangdong, Shandong, Shanghai and Hebei. Zhang explains that the economic pay-offs to FDI are significant only in the cities where human capital is high enough. This empirical finding supports the idea that human capital enhances the ability to absorb new knowledge and technology. Therefore, China can potentially increase the impact of FDI on productivity growth by implementing education policies in inland cities where human capital formation is inadequate or of a low-quality.

One of the motivations for China to open its economy to FDI was to improve the productivity performance of domestic firms by learning advanced technology and acquiring modern management skills (Lardy, 1994). Thus, firm-level evidence of productivity gains associated with FDI is a criterion for the Chinese government to measure the success of its FDI policies. Indeed, Zhou, Li and Tse (2000) investigate how FDI affects the productivity of Chinese domestic firms by using a sample of 27,928 local firms from the industrial census of National Bureau of Statistics of China in 1995.

After controlling for all relevant firm-level and industry-level determinants of the firm productivity, Zhou, Li and Tse find that a domestic firm's productivity is positively affected by FDI's share and its history in the region. In other words, domestic firms that are located in regions that attract more firms or have a longer history of FDI tend to have higher productivity. This finding suggests that the mere presence of FDI exerts positive externalities on local firms by pressuring them to improve their management, marketing skills and competitiveness. On the other hand, empirical evidence estimates that domestic firms in industries that have more FDI or

have a longer history of FDI tend to experience lower productivity. The more FDI and the earlier FDI enters an industry, the lower the productivity performance of the local firms in the industry. This can be explained in two ways. Firstly, foreign-invested enterprises have competitive advantages over local firms such that the latter become unprofitable, go bankrupt and exit at worst. Secondly, there exists a significant wage gap between domestic and foreign-invested enterprises in the same industry and this may cause a transfer of experienced employees from the former to the latter (Ramasamy and Yeung, 2003).

Given these firm-level empirical findings by Zhou, Li and Tse, the best FDI strategy for China is to attract foreign investors to develop new industries in a given region. As foreign investors venture into new industries in a region, local firms in the same region but operating in other industries would experience a productivity growth; when FIEs create linkages with local firms of upstream or downstream industries, the former may transfer production efficiency to the latter in the form of either price or quality competitiveness. Besides, local firms can learn from merely observing advanced production, management and marketing practices of FIEs. On the other hand, the productivity of local firms would be adversely affected by foreign firms investing in the same industry; directly competing with foreign firms that excel in cost efficiency and technological capacity, local firms will not only lose their market share but also productivity, at least in the short run, as more productive factors move to foreign firms in pursuit of higher market returns. In terms of raising the productivity of Chinese local firms, this study suggests that direct market competition is a less desirable consequence of attracting FDI than the spill-over effects of foreign technology and management skills.

That we find industry, province and firm-level empirical evidence of productivity-promoting FDI inflows is of a particular importance for China in light of its high domestic savings. A developing economy with insufficient domestic savings is expected to benefit from FDI as a source of foreign capital to finance investment and promote economic growth. Yet, China's trade surplus since 1994 (Table 3.5) suggests that the economy has been recording net savings; by an accounting identity, a trade balance is an approximate measure of total net domestic savings. Thus, China has been saving more than spending on investments since 1994. Meanwhile, FDI share of total fixed capital investment has not exceeded 18 percent since 1994 (Table 3.1). Thus, China has been financing more than 80 percent of its total fixed capital investment with its domestic savings and other forms of foreign capital. Therefore, the role of FDI in capital formation is less important for China than its impact on the productivity with which resources are allocated and combined to maximize national output. While domestic savings and other sources of foreign capital can finance capital accumulation, the dynamic role of FDI inflows has additional benefits of promoting productivity growth in China through technology transfer and efficiency improvement.

3.4 FDI and trade performance

In this sub-section, we outline both macro- and micro-economic approaches to explaining the relationship between FDI and international trade before analyzing the empirical evidence in the case of China. Sun (1999) presents two macro explanations. Trade-substituting model of FDI was initially proposed by R. Mundell in 1957. Foreign direct investment changes the quantity

and quality of production factors in both the host and investing countries because FDI transfers capital and labor inputs from the investing country to the host country along with the technological skills and management know-how embodied in transferred capital and labor. This factor movement has a potential to change the structure of factor endowments and thus, the comparative advantages in respective countries. If so, FDI will tend to substitute for trade because differences in relative factor endowments, the very determinants of international trade according to the Heckscher-Ohlin Samuelson model, will diminish to eventually exist no longer.

Sun (1999) also introduces a trade-complementing model of FDI, first proposed by D. Purvis in 1972. Suppose country A is a country with a comparative advantage in capital-intensive sectors and country B in labor-intensive sectors. Because country B is relatively capital scarce, the economic payoffs to capital in this country must be higher than in country A, given the diminishing returns to capital. Therefore, when country A invests in country B, the increase in capital-intensive products in country B will be greater than the decrease in equivalent products in country A. Thus, FDI generates a total net gain in output level in this two-country model. According to this scenario, capital movements by multinational companies (MNCs) will complement to international product trade.

In reference to these two theories that link FDI and international trade, Kojima (1975) classifies FDI into two categories. FDI is trade-creating when it flows into labor-intensive industries where the host country has a comparative advantage. In this case, transfer of advanced technology, management and marketing expertise and even an entrepreneurial spirit that FDI generates tends to improve the productivity of labor-intensive firms and industries and stimulate exports. On the other hand, FDI is trade-substituting when it flows into capital or technology-intensive industries where the host country is comparatively disadvantaged. This form of FDI

supplies capital goods that the host economy would otherwise import through international market transactions. Moreover, capital-intensive FDI inflows may discourage the establishment of import-substituting capital-intensive industries in the host country and substitute for potential opportunities for this developing economy to export capital-intensive products in which it may gain a comparative advantage in the future[2]. However, this elaborate classification simplifies the complexities involved in assessing the overall net impact of FDI on foreign trade performance of the host country, because MNCs are usually diversified across capital, technology and labor-intensive industries.

Meanwhile, Sun (1999) proposes a microeconomic approach to explaining the impact of FDI on foreign trade. He examines the behavior of the multinational corporations (MNCs) as enterprises that own and control value-adding activities in two or more countries. Indeed, MNCs are central to studying the relation between FDI and international trade; United Nations (2002) estimate that at least 25% of international trade is carried by MNCs through intra-firm trade while MNCs undertake world-wide linkages in production, marketing and R&D and facilitate flows of information and commodities.

The particularly worsening effect of MNCs on the trade balance of the developing host country is based on the fact that MNCs integrate their production activities both horizontally and vertically. This production integration creates intra-firm trade within the MNC system, which in turn, encourages a MNC to shift profits out of its host countries to its parent company or to other subsidiaries located in countries where taxation is low and investment risks are reduced. To maximize their profits, MNCs manipulate transfer pricing by over-pricing imports and under-

[2] South Korea, a newly industrialized economy, exemplifies this case. Even though South Korea was not initially endowed with capital and technology in 1960s, South Korean government created comparative advantage in some capital and technology-intensive industries by promoting and rigorously protecting selected industries against foreign direct investment. Today, South Korea is a main exporter of steel, ship and automobile.

pricing exports. This practice adversely affects trade balance of the host country and can offset the potential benefits of FDI in the economy.

Table 3.5 illustrates how significant is the contribution of FDI to China's export and import growth. While China's export volume expanded from about $22 billion in 1981 to about $326 billion in 2002 at an annual average growth rate of 17.3 percent, FDI-led exports undertook an even more rapid expansion at an average annual growth of 54.8 percent during the period of 1981-2002. Since 1985, FDI-led export performance has taken a consistently larger share of China's total exports. The share records only 1.1 percent in 1985 but exceeds 20 percent by 1992 and 40 percent by 1996. In 2001, FDI-led exports represented more than half of China's total exports. Foreign direct investment in China also shows a consistent and rapid increase in its import share during the period of 1981-2002; FDI-led import represented only 0.5 percent of China's total imports in 1981 but by 1996, more than half of China's imports were attributable to FIEs.

Since the increase in net export is a direct determinant of output expansion, it is important to examine the contribution of FDI to China's trade balance. Except for 1983, FDI-led imports exceed exports in each consecutive year from 1981 to 1997. Such a trade deficit adversely affects China's overall trade balance. The foregone increase in net exports, a component of aggregate expenditures, implies that there is a forgone expansion in national income associated with the FDI-led trade deficit. However, FDI-led exports exceed imports from 1998 on. Recent trade surplus by FIEs has contributed to China's overall trade balance. In 2002, for example, approximately 32% of China's trade surplus was attributable to FDI-led trade performance. This indicates that FDI played an important role in leading China's recent net export growth.

In light of Kojima's theory of FDI and trade, it is appropriate to examine any trade-creating and trade-substituting evidence of FDI inflows to China. Since China has a comparative advantage in labor, FDI in light manufacturing is expected to raise labor productivity and enhance export activities by transferring advanced technology, efficient management and innovative marketing strategies to the industry. Empirical evidence for any export-promoting FDI in light manufacturing requires not only industry-specific data but also firm-level data; the productivity-enhancing linkages between local firms and foreign-invested enterprises occur mostly at a firm level. Due to the data and time limitations, this study cannot be undertaken in this paper.

FDI inflows to capital and technology-intensive industries are expected to displace export and import activities because FDI is essentially an alternative mode of entry to China; instead of importing capital and technology-embodied products, China depends on FDI as a supplier of the needed capital and technology in the economy. Likewise, China is discouraged to develop and export capital and technology-intensive goods and services because FDI substitutes potential domestic suppliers of capital and technology. Again, this requires a comprehensive study of the firm-level export activities as well as the impossible task of estimating China's export behavior if FDI were absent in capital and technology-intensive industries.

Meanwhile, Table 3.6 shows that China's exports in high-tech products grew at an average annual growth rate of 32.3 percent during the period of 1996-2002 so that high-tech products as a share of national total exports increased from 8.4 percent in 1996 to 20.8 percent in 2002. This may suggest that FDI inflows to technology-intensive industries create exports in technology-scare China. However, foreign-invested enterprises take an increasing share of total exports in high-tech products at the expense of its local counterparts. In 1996, FDI undertook 58.6 percent

of China's total exports in high-tech products while domestic firms took a share of 41.4 percent. Yet, in 2002, 82 percent of total exports in high-tech products are led by FDI whereas only 16 percent are attributable to domestic firms. From the table, we can infer that FDI may promote total exports of capital and technology-intensive products in China but it does not necessarily enhance the export performance of domestic producers.

A microeconomic approach to FDI and trade investigates the effect of manipulative transfer pricing on China's trade balance. Since Hong Kong direct investment is predominant in China-Hong Kong bilateral trade and takes a share of more than 45 percent of total FDI inflows to China, Sun (1999) examines indicators of transfer pricing manipulated by Hong Kong's MNCs. Using data from *Commodity Trade Statistics* published by the United Nations, Sun finds that export prices from China to Hong Kong were under-priced by 15 percent, whereas China's imports from Hong Kong were over-priced by 9 percent for the selected 150 commodities in 1994. These over-priced imports and under-priced exports by Hong Kong MNCs indicate the foregone net export gains and the corresponding loss in total output of Chinese economy.

In addition, manipulative transfer pricing is expected to distribute income from Chinese partners to Hong Kong partners in joint-ventures because MNCs are primarily motivated by the maximization of their global profit. Coupled with the potential reduction in the tax revenue of the government, this income loss would be evidence for the negative impacts of FDI on China's economic growth. Yet, it is necessary to collect detailed data at a firm-level to measure the importance of the taxation and profit losses associated with manipulative transfer pricing by MNCs. Given the data constraint, it is inappropriate to conclude unambiguously that transfer pricing significantly harms economic growth due to the foregone net exports and income losses.

Although the trade performance of FDI may deteriorate China's trade balance through manipulative transfer pricing, Sun (1999) argues that the high concentration of FDI-led exporting in labor-intensive products improves the efficiency of resource allocation, as a large number of workers would otherwise be unemployed if FDI inflows were to shift towards capital/technology-intensive industries. The overall economic, social and even political effects of employment creation may compensate for FDI-led trade deficits. In fact, employment by foreign-invested enterprises has increased from 6.2% in 1995 to 15.7% of total employment in China's manufacturing sector in 2002 (Xiaojuan, 2004). Besides, foreign investors bring in capital, technologies and management skills to be combined with Chinese labor resources and raise labor productivity that may compensate for any deteriorating effect of MNCs on net export performance.

V. Costs of FDI for Chinese economy

This section discusses two salient costs associated with FDI. In the previous section, we examined empirical evidence of three different channels through which FDI contributes to China's economic growth. Yet, the opportunity costs of attracting FDI in China may potentially cancel out some of its positive economic effects.

5.1 FDI and regional income disparity

A casual look at Table 4.1 suggests a correlation between income distribution and FDI distribution across eastern, central and western regions of China. In 2000, the GDP share of eastern coastal region is 64.3%, far outstripping central and western regions, each of which claims 29.4% and 14.6% of total GDP respectively. This income share is particularly outstanding, given that the population share is much more evenly distributed across three regions. Such a regional income distribution corresponds to regional FDI disparities. The eastern region that has the largest share of national GDP attracts 85.96 percent of total FDI inflows to China whereas the central region with the second largest share of GDP attracts only 8.78 percent of total FDI. The rest 5.26 percent of total FDI flows to the western region where the GDP share is the lowest.

Addressing the causal relationship between FDI and wage rates, Ramasamy and Yeung (2003) help explain the regional income disparity as reflected in the uneven distribution of FDI. Using data on 31 provinces from *The China Statistical Yearbook* for the period of 1985-2000,

they conduct both a Granger causality analysis[3] and the conventional panel data regression methods to find that FDI contributes to increasing wage rates in China. The study finds that provinces that attract a larger amount of FDI tend to experience higher wage rates. In addition, Ramasamy and Yeung find that lower wage rates are not significantly correlated with higher amount of FDI in China. Against our conventional wisdom that China's cheap labor relative to the investing country is one of the determinants of FDI inflows, the study demonstrates that low wage rates are not an incentive for FDI.

The study above suggests that FDI tends to exacerbate the unequal income distribution in China. Provinces that attract most FDI are the ones experiencing an upward pressure on wage rates whereas FDI does not have significant incentives to flow into low-income provinces and contribute to their income growth. Unless FDI-led income growth filters downward and ultimately transfers to other regions through linkage effects, China's regional income disparity will be sustained. Thus, Ramasamy and Yeung suggest that China should improve determinants of FDI other than labor cost in inland regions.

Given that one cannot alter the unfavorable geographical and natural conditions of inland provinces, government can initiate formulating a series of incentive policies to alleviate regional income inequality. In fact, the government's strategy to give priority to the development of the eastern coastal region and provide it with a package of preferential treatments was the very incentives for FDI to flow in the region and contribute to its economic growth since 1979, leaving relatively backward the central and western regions. Therefore, it is conceivable to close the income gap between regional economies in China by implementing FDI incentive policies in

[3] Granger (1969) states the notion of causality as the following; "if X is causing Y, we are better able to predict Y using all available information than if the information apart from X had been used".

underdeveloped inland regions such as the strategy of "Go To West" that the central government adopted in 1999.

5.2 Transnational corporations and imperfect market structure

Profit-maximizing firms must possess enough competitive advantages to overcome the intrinsic costs associated with investing overseas such as the less-well defined property rights and uncertainties of a developing economy (Moran, 1998). The transnational firms and corporations would possess competitiveness in the form of technology ownership, management expertise or economies of scale. Thus, their overseas investment, and in particular an investment made in the form of mergers and acquisitions, will tend to wipe out competition in the host market, restrain domestic investment and extract high prices from consumers (Xiaojuan, 2004). In the form of high profits at the expense of the local producers and consumers, foreign investors would absorb partially the potential economic gains accrued to China from attracting FDI.

China's automobile market is a good example of this imperfect market structure initiated by FDI (Xiaojuan, 2004). For 16 years from 1983 to 1999, market power in the car-manufacturing industry in China was highly concentrated in the hands of Shanghai Volkswagen Co., Ltd., a joint venture between Germany's Volkswagen and the Shanghai Automotive Co.Ltd. This joint-venture monopolized the market without introducing any new models that its parent company had introduced to the global market. Such a monopoly not only erected high entry barriers to potential Chinese producers but also reduced consumer welfare by high prices and limited car choices relative to the global auto market. Although the market share of Shanghai Volkswagen

Co. Ltd shrank to 90 percent in early 1990s and further to 60 percent by mid-1990s, this small increase in market competition reflects merely an oligopoly market structure in which Shanghai Volkswagen Co. competes with new transnational automobile enterprises rather than with domestic auto companies.

Meanwhile, Zheng and al. (2004) underline that the imperfect market competition of the transnational corporations is a short-term consequence of the competitive advantages they possess over the local competitors. In the long run, FIEs will strengthen the competitive position of the local enterprises as the former forces any surviving local firms to become more efficient. Indeed, there is evidence for the competitiveness of local firms over their foreign counterparts in Chinese market. The number one producer of television sets is not *Sony* but *Changhong*, and the producer of personal computer with the biggest market share is not *IBM* but *Legend,* a local Chinese firm.

VI. Conclusion and Policy implications

This paper studies the effects of foreign direct investment on Chinese economy. First, the study examines diverse motivations and strategies of FDI and finds that FIEs are more likely to be welfare-promoting when their investment activities are domestic-market oriented, capital-intensive and linked with the local enterprises. Then, the paper analyzes the positive impact of FDI on China's domestic investment, productivity growth and trade performance as three determinants of FDI-led economic growth. Despite the positive contribution of FDI to China's economic growth, FDI does affect Chinese economy in a detrimental way, at least in the short run, by widening regional income inequality and creating imperfect market competition.

We suggest policy implications with regards to FDI that generates both beneficial and deteriorating impacts on Chinese economy. While its net economic effect is contentious, it is important to justify incentive policies for FDI in light of its second best alternative. In other words, policy-makers should examine the opportunity cost of attracting FDI. For example, exposing local firms to the domestic market full of foreign firms is an alternative development strategy for promoting the competitiveness of local firms to directly protecting local firms on the basis of infant industry stage. Besides, government budget spent on research and development (R&D) activities may be a less costly alternative to implementing FDI incentive policies as a strategy for improving technology and productivity in the economy.

Fu (1999) examines how the location-specific FDI-related policies affect the behavior of FDI in China. Using data on 29 Chinese provinces, Fu runs multiple regression of the cumulative realized amount of FDI on economic, cultural and institutional determinants. The empirical

results in Table 5.1 show that the estimated coefficient on policy variable - a dummy variable measured as categorized values depending on the number and size of special economic zones - decreases from 1.10 to 0.69 to 0.49 along the three consecutive periods in the evolution of China's FDI regulatory framework. While policy variable remains statistically significant, the diminishing value of its coefficient suggests that policy incentives become less important as a determinant of FDI over time as China's inland provinces start to offer similar preferential treatments to FDI in 1990s.

On the other hand, the coefficients on economic determinants of FDI become more pronounced over time; for example, a one percent increase in market size has no significant impact on FDI growth in period I, whereas it results in a 0.99 percent increase and a 1.08 percent increase in FDI in period II and III respectively. Also, a one percent increase in wage rate significantly discourages FDI in period II and III whereas it is found to have no significant impact on FDI in period I. Moreover, productivity becomes a significant positive determinant of FDI inflows in period II. Hence, Fu finds that FDI incentive policies are becoming less effective and economic factors more effective in attracting FDI, suggesting that promoting more favorable economic conditions would be a better alternative to FDI-related policies for attracting FDI.

Shan, Tian and Sun (1999) lend support to the findings above. Their study finds a two-way causality between FDI growth and industrial growth in China over the period of 1985-96. In addition to finding empirical evidence for the FDI-led growth hypothesis, the study shows that economic growth itself has a causal effect on FDI inflows to China. This reinforcing relationship between FDI inflow and GDP growth suggests that the expansionary fiscal or monetary policies can be used as a policy tool for attracting FDI in China as well as promoting GDP growth. In fact, Blomstrom and Kokko (2003) find that investment incentives that are exclusively designed to

attract foreign firms are not an efficient way to raise national welfare because the potential benefits of FDI are realized only if local firms have the ability and incentives to invest in absorbing foreign technologies and management skills. Thus, he claims that FDI incentive policies should be accompanied with subsidization programs for technical training and R&D activities of the local firms. In a word, they argue for a set of policies that give equal investment incentives to local and foreign firms.

Since FDI inflow does create negative repercussions to Chinese economy, policy-makers should allocate resources to assure economic stability and growth rather than exclusively implement incentive policies for FDI whose effect on Chinese economy is uncertain. In a word, growth-driven FDI is preferable to FDI-led growth in China. Meanwhile, to fully capture the role of FDI in Chinese economy, this paper needs further investigation into the effects of FDI on China's financial variables such as exchange rate and interest rate. Moreover, we can gain further understanding of China's FDI by distinguishing and analyzing its short term and long term effects on Chinese economy. Finally, this paper recognizes the need for detailed regional, firm and industry-level studies on the effect of FDI on Chinese economy. Above all, it is important to examine the accuracy of the data used in this study on which depends the validity of the major findings of this investigation.

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Table 1.1 – FDI stock and growth rate, 1979-2002

Unit: US$ 100 Million, %

Year	Realized Value of FDI	Average Growth rate (%)
1979-82	17.67	62.8
1983-86	65.35	53.9
1987-90	123.35	12.5
1991-94	766.56	87.5
1995-98	1699.67	7.8
1999-2002	1776.55	4.4

Source: Xiaojuan, 2004; data drawn from MOFTEC (Ministry of Foreign Trade and Economic Cooperation) of China, 2002. *Statistics on FDI in China.*

Table 1.2 – Industrial distribution of cumulative FDI, 2000

Unit: RMB 100 million, %

Industry	Realized FDI value	Share (%)
All industry	5560.76	100.00
Electronics and Telecommunications	2814.99	50.62
Metal Products	547.88	9.85
Garments and other fiber products	493.78	8.88
Plastic Products	453.64	8.16
Leather, Furs, Down and related products	319.43	5.74
Food manufacturing	296.54	5.33
Instruments, Meters, Official Machinery	237.10	4.26
Cultural, educational and Sports articles	178.98	3.22
Timber Processing, Cane, straw products	121.17	2.18
Furniture Manufacturing	97.25	1.75

Source: SSB, 2002. *China Statistical Yearbook*

Table 1.3 – Sectoral Distribution of Cumulative FDI, 2002

Unit: US$ 100 Million, %

Sector	Contractual FDI value	Share %
Total	7452.91	100
Industry	4631.60	62.14
Property and Utilities	1688.76	22.66
Wholesale, Retailing, Catering	247.94	3.33
Construction	215.14	2.89
Transport, Warehousing, Post, Telecommunications	172.70	2.32
Agriculture, Forestry, Animal Husbandry, Fishery	140.71	1.89
Health Care, Sports, Social Welfare	49.06	0.66
Scientific Research, Technical Services	27.79	0.37
Education, Culture, Arts, Broadcasting, Film Industries	21.95	0.29
Other Sectors	257.26	3.45

Source: see Table 1.1

Table 1.4 – Regional Distribution of FDI, 2001

Unit: US$ 100 Million, %

Region	Realized FDI value	Share %
Total	3952.23	100.00
East	3397.26	85.96
Central	346.93	8.78
West	208.04	5.26

Source: see Table 1.1

Table 1.5 – Top 15 Foreign Investors in China, 2002

Unit: US$ 100 Million

Country	Realized FDI Value	Share %
Total	44796597	100.00
Hong Kong	20487523	45.73
U.S.A.	3988943	8.90
Japan	3633986	8.11
Tawain	3311028	7.39
Virgin Irelands	2438765	5.44
Singapore	2147270	4.79
R.O.K	1519896	3.39
U.K.	1069550	2.39
Germany	799367	1.78
France	554335	1.24
Macao	477322	1.07
Netherlands	433815	0.97
Cayman Irelands	380333	0.85
Canada	335789	0.75
Malaysia	283544	0.63

Source: see Table 1.1

Table 2.1 – Local content of input and Export/output ratio of FDI, 1992

Unit: 100 Million yuan renminbi

Selected Industries	Total Intermediate Inputs	Local Content of inputs (%)	Imported Content of inputs (%)	Export/output Ratio (%)
Food, Beverage	243.47	87.09	12.91	35.08
Textile	235.92	72.82	27.18	77.20
Sewing, Leather products	369.13	68.28	31.72	91.73
Wood products	50.48	77.39	22.61	33.32
Paper, Printing, Stationery	94.75	75.31	24.69	66.66
Chemicals	301.08	74.72	25.29	28.82
Building Materials	61.65	82.98	17.02	24.34
Metal Smelting	174.22	71.99	28.01	21.00
Machinery	121.85	71.12	28.88	49.01
Transport Equipment	242.08	74.35	25.65	14.59
Electrical products	119.58	71.23	28.77	51.97
Electronic products	328.77	61.69	38.31	56.09

Source: Sun, 1996; data drawn from MOFTEC, 1993. *The Annual Statistical Report of China's Foreign Trade*, Beijing: China Social Sciences Press, and, SSB, 1993. *Annual Statistical Report on China's Industry*, Beijing: China Statistical Publishing House.

Table 2.2 – Average Capital/labor ratios of FIEs (%)

Year Country	1993	1994	1995
Korea	2.12	2.91	3.60
Hong Kong	23.79	30.94	20.32
U.S.	26.73	14.80	16.42

Source; Park and Lee, 2003; survey on 39 FIEs in Shandong provinces

Table 3.1- Share of realized FDI in China's total investment in fixed assets (%)

Unit: US$ 100 million, %

Year	Total investment in fixed assets	Realized FDI	Realized FDI as a share of Total investment in fixed assets
1991	1001.60	43.66	4.36
1992	1465.22	110.08	7.51
1993	2268.71	275.15	12.13
1994	1977.34	337.67	17.08
1995	2397.23	375.21	15.65
1996	2763.22	417.26	15.10
1997	3059.57	452.57	14.79
1998	3437.29	454.62	13.23
1999	3608.00	403.18	11.17
2000	3944.26	407.15	10.32
2001	4445.54	468.46	10.54
2002	5205.06	527.43	10.13

Source: See Table 1.1

Table 3.2 – Estimated effect of FDI on Total Factor Productivity, 1995

Dependent variable; total factor productivity

Independent Variables	Coefficient
RFDI	0.16 (8.36)**
FS	0.08 (4.45)**
R&D	0.03 (2.22)*
H	0.11 (0.61)

Adj. R-square; 0.40, No. of observations=189

t-statistics in parentheses
**Statistically significant at 1% level, * statistically significant at 5%

Where TFP= total factor productivity of domestic industrial sectors
RFDI = the ratio of FDI to total capital in a sector
FS = firm size, the ratio of sales value to the total number of domestic firms, used as a proxy for economies of scale
R&D = R&D expenditures
H = human capital, the ratio of workers with secondary school certificate to total employees in labor force.

Source; Liu and Wang, 2002. "Does foreign direct investment facilitate technological progress? Evidence from Chinese industries"

Table 3.3 – Determinants of Growth with a Panel Data Regression, 1984-1997

Dependent variable; national output

Independent Variables	Coefficient
Physical Capital	0.554 (0.028)*
Human Capital	0.452 (0.027)*
FDI	0.0001 (0.002)

R-square = 0.968
No. of observations =271
* Statistically significant at 1% level
Standard errors in parentheses

Source; Zhang, 2002. "Productivity and Economic growth: An Empirical Assessment of The Contribution of FDI to the Chinese Economy"

Table 3.4 – Determinants of Economic Growth in Selected Regions, 1984-97

Regions	Physical Capital	Human Capital	FDI	Adjusted R-square
Coastal & Metropolitan areas				
Beijing	0.561 (0.149)*	0.591 (0.143)*	0.126 (0.068)**	0.777
Fujian	0.613 (0.110)*	0.413 (0.116)*	0.065 (0.038)***	0.973
Guangdong	0.368 (0.264)***	0.522 (0.116)*	0.125 (0.075)***	0.975
Jiangsu	1.165 (0.296)*	0.148 (0.164)*	-0.327(0.295)	0.741
Shandong	0.578 (0.160)*	0.413 (0.151)*	0.016 (0.011)***	0.993
Shanghai	0.605 (0.105)*	0.542 (0.093)*	0.083 (0.101)	0.889
Tianjin	0.526 (0.135)*	0.818 (0.245)*	0.387 (0.220)***	0.883
Zhejiang	0.902 (0.202)*	0.022 (0.135)*	0.015 (0.076)	0.780
Liaoning	0.862 (0.127)*	0.105 (0.190)*	-0.200 (0.189)	0.841
Hebei	0.699 (0.208)*	-0.107 (0.141)*	0.329 (0.194)***	0.860
Inland areas				
Henan	1.069 (0.337)*	-0.012 (0.250)	-0.172 (0.374)	0.767
Hubei	1.002 (0.248)*	-0.202 (0.172)	-0.210 (0.248)	0.680
Jilin	0.744 (0.164)*	0.410 (0.182)**	-0.036 (0.184)	0.695
Jiangxi	0.953 (0.336)*	0.266 (0.238)	-0.191 (0.326)	0.487
Ningxia	0.235 (0.418)	-0.436 (0.558)	0.302 (0.350)	0.656
Shannxi	0.714 (0.218)*	-0.332 (0.266)	-0.075 (0.262)	0.603
Sichuan	0.984 (0.346)**	0.185 (0.102)***	-0.061 (0.488)	0.575
Yunnan	0.654 (0.375)***	-0.141 (0.320)	-0.042 (0.313)	0.355

* 1% significance level
** 2% significance level
*** 3% significance level
Standard errors in parentheses

Source; Zhang, 2002. "Productivity and Economic growth: An Empirical Assessment of the Contribution of FDI to the Chinese Economy"

Table 3.5 – The share of FDI in China's trade balance, 1981-2002

Unit; US$100 million

Year	EXPORTS			IMPORTS			TRADE BALANCE	
	Total	FIEs	Share (%)	Total	FIEs	Share (%)	Total	FIEs
1981	220.1	0.3	0.1	220.2	1.1	0.5	-0.1	-0.8
1982	223.2	0.5	0.2	192.9	2.8	1.4	30.3	-2.3
1983	222.3	3.3	1.5	213.9	2.9	1.3	8.4	0.4
1984	261.4	0.7	0.3	274.1	4.0	1.5	-12.7	-3.3
1985	273.5	3.0	1.1	422.5	20.6	4.9	-149.0	-17.6
1986	309.4	5.8	1.9	429.0	24.3	5.7	-119.6	-18.5
1987	394.4	12.1	3.1	432.2	31.2	7.2	-37.8	-19.1
1988	475.2	24.6	5.2	522.8	57.5	11.0	-47.6	-32.9
1989	525.4	49.1	9.4	591.4	88.0	14.9	-66.0	-38.9
1990	620.9	78.1	12.6	533.5	123.1	23.1	87.4	-45.0
1991	719.1	120.5	16.8	637.9	169.1	26.5	81.2	-48.6
1992	850.0	173.6	20.4	806.1	263.9	32.8	43.9	-90.3
1993	917.6	252.5	27.5	1,039.5	418.3	40.2	-121.9	-165.9
1994	1,210.1	347.1	28.7	1,156.1	529.3	45.8	54.0	-182.2
1995	1,487.7	468.8	31.5	1,320.8	629.4	47.7	166.9	-160.6
1996	1,510.7	615.1	40.7	1,388.4	756.0	54.5	122.3	-141.0
1997	1,827.0	749.0	41.0	1,423.6	777.2	54.6	403.4	-28.2
1998	1,837.6	809.6	44.3	1,401.7	767.2	54.7	435.9	42.4
1999	1,949.3	886.3	45.5	1,657.2	858.8	51.8	292.1	27.5
2000	2,492.1	1,194.4	47.9	2,251.0	1,172.7	52.1	241.1	21.7
2001	2,661.6	1,332.4	50.1	2,436.1	1,258.6	51.7	225.5	73.8
2002	3,255.7	1,699.4	52.2	2,952.2	1,602.9	54.3	303.5	96.5

Source: Xiaojuan, 2004; data from MOFTEC of China, 2002. *Statistics on FDI in China.*

Table 3.6 – FDI share of total exports in High-Tech products, 1996-2002

Unit; US$ 100million, %

Year	Total Exports in high-tech products			Share of	Share of Exports led
	Volume	Growth	Share of national total exports	FDI-led Exports	By domestic firms
1996	126.6		8.4	58.6	41.4
1997	163.1	28.8	8.9	66.8	33.2
1998	202.5	24.2	11.0	73.8	26.2
1999	247.0	22.0	12.7	76.0	24.0
2000	370.4	50.0	14.9	81.0	19.0
2001	464.6	25.4	17.5	81.5	18.5
2002	678.7	46.1	20.8	82.0	18.0

Source; Xiaojuan, 2004; data provided by Ministry of Science and Technology of the People's Republic of China.

Table 4.1 – Regional share of GDP and FDI, 2001

Region	GDP share (%)	Population share (%)	Realized FDI value (US$100m)	FDI share
East	64.3	42.3	3397.26	85.96
Central	29.4	34.4	346.93	8.78
West	14.6	23.3	208.04	5.26

Source: SSB of China, 2002. *China Statistical Yearbook*

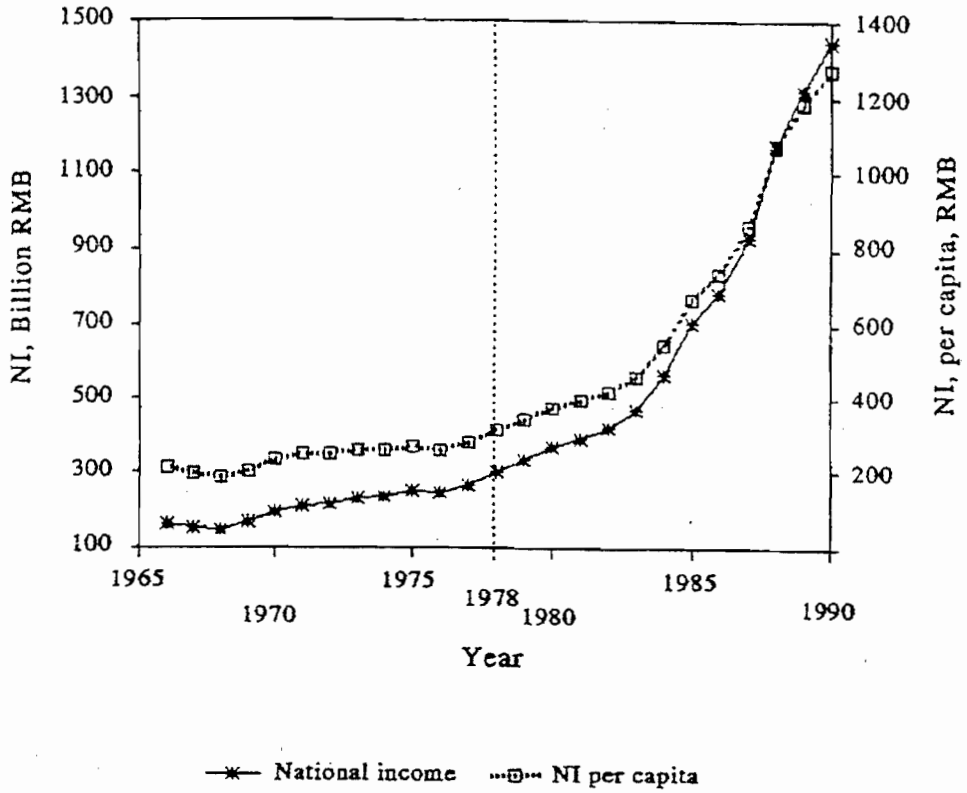
Table 5.1 – Regression results; Policy impact on FDI

	Period I (1979-84)	Period II (1985-90)	Period III (1991-96)
Policy	1.10 (2.05)**	0.69 (2.36)**	0.49 (2.49)**
Cultural distance	-0.53 (-1.63)**	-0.10 (-0.24)	-0.01 (-0.10)
Market	0.07 (0.08)	0.99 (2.21)**	1.08 (5.21)**
Wage	5.01 (0.66)	-3.90 (-1.40)*	-3.16 (-1.81)**
Productivity	-0.12 (-0.06)	3.24 (2.35)**	2.25 (1.70)**
Infrastructure	0.04 (0.03)	-0.38 (-0.72)	0.26 (0.10)
Constant	-13.19 (-0.61)	12.76 (1.35)	11.14 (1.76)**
Adj. R-square	0.46	0.65	0.81

t-statistics in parentheses
*** Statistically significant at 1% level
**Statistically significant at 5% level
*Statistically significant at 10% level

Source; Fu, Jun, 1999. "Explaining FDI in China's Transitional Economy"

Figure 3.1 - Expansion of (per capita) National Income in China, 1965-90



Source: Chen, Chung, Lawrence Chang, and Yimin Zhang, 1995. "The Role of Foreign Direct Investment in China's Post-1978 Economic Development"

Figure 3.2 – Estimated effect of FDI on per capita real GDP, 1983-2001

$$\ln Yt = \underset{(4.46)^*}{4.074} + \underset{(1.96)}{0.248 \ln DIt} + \underset{(3.26)^*}{0.137 \ln FDIt} + \underset{(0.00)}{0.000 \ln FKt} + \underset{(3.23)^*}{0.063t}$$

Adj. R-squared; 0.9935, No. of observations=19

t-statistics in the parentheses, * statistically significant at 1% level

where Yt = per capita real GDP in year t
DIt= domestically-financed fixed capital investment in year t
FDIt= foreign direct investment in year t
FKt= foreign capital other than FDI in year t
T = a monolithic increase (time-trend variable)

Source; SSB of China, 2002. *China Statistical Yearbook*

Figure 3.3 – Estimated lagged effect of FDI on per capita real GDP, 1984-2001

$$\ln Yt = \underset{(7.72)^{**}}{5.324} + \underset{(1.34)}{0.125 \ln DIt\text{-}1} + \underset{(7.25)^{**}}{0.233 \ln FDIt\text{-}1} - \underset{(-2.86)^*}{0.105 \ln FKt\text{-}1} + \underset{(4.35)^{**}}{0.066t}$$

Adj. R-squared ; 0.9960, No. of observations = 18

t-statistics in the parentheses, *statistically significant at 5% level, ** statistically significant at 1% level

Where Yt = per capita real GDP in year t
DIt-1= domestically-financed fixed capital investment in year t-1
FDIt-1= foreign direct investment in year t-1
FKt-1= foreign capital other than FDI in year t-1
T = a monolithic increase (time-trend variable)

Source; SSB of China, 2002. *China Statistical Yearbook*

Figure 3.4 – Estimated effect FDI on domestic investment, 1983-95

$$\ln DK = -1.407 + 0.802 \ln YPC + 0.118 \ln FDI + 0.01 \ln FK$$
$$(-1.96) \quad (7.61)^* \quad (5.64)^* \quad (1.01)$$

R-square; 0.7021, No. of observations =130

t-ratios in the parentheses, * statistically significant at 1% level

where DK = domestically-financed fixed capital investment
YPC = income per capita
FDI = foreign direct investment
FK = foreign capital other than FDI

Source: Sun, 1998. "Macroeconomic Impact of Direct Foreign Investment in China"

Figure 3.5 – Estimated effect of FDI on domestic investment, 1983-2001

$$\ln DKt = -0.330 + 1.276 \ln YPCt - 0.053 \ln FDIt - 0.057 \ln FKt$$
$$(3.210)^* \quad (6.83)^{**} \quad (3.07)^* \quad (0.89)$$

Adj. R-squared; 0.9808, No. of Observations=19

t-statistics in the parentheses,
*statistically significant at 5% level, ** statistically significant at 1% level

Where DKt = domestically-financed fixed capital investment in year t
YPCt = income per capita in year t
FDIt = foreign direct investment in year t
FKt = foreign capital other than FDI in year t

Source; SSB of China, 2002. *China Statistical Yearbook*

Figure 3.6 – Estimated lagged effect of FDI on domestic investment, 1984-2001

$$\ln DK_t = -1.110 + 1.086 \ln YPC_{t-1} - 0.046 \ln FDI_{t-1} - 0.125 \ln FK_{t-1}$$
$$(4.65) \quad (5.30)^{**} \quad (3.98)^{*} \quad (0.22)$$

Adj. R-squared; 0.9808, No. of Observations=19

t-statistics in the parentheses,
*statistically significant at 5% level, ** statistically significant at 1% level

Where DKt = domestically-financed fixed capital investment in year t
YPCt-1 = income per capita in year t-1
FDIt-1 = foreign direct investment in year t-1
FKt-1 = foreign capital other than FDI in year t-1

Source; SSB of China, 2002. *China Statistical Yearbook*