DISCUSSION PAPERS IN ECONOMICS

Working Paper No. 04-06

The Chaotic Attractor of Foreign Direct Investment - Why China? A Panel Data Analysis

Frank S.T. Hsiao
Department of Economics, University of Colorado at Boulder
Boulder, Colorado

Mei-chu W. Hsiao
Department of Economics, University of Colorado at Denver
Denver, Colorado

May 2004

Center for Economic Analysis
Department of Economics

University of Colorado at Boulder
Boulder, Colorado 80309

The Chaotic Attractor of Foreign Direct Investment - Why China? A Panel Data Analysis

Frank S.T. Hsiao[a,*], and Mei-chu W. Hsiao[b]

a. Department of Economics, University of Colorado at Boulder, CO 80309-0256, USA
b. Department of Economics, University of Colorado at Denver, CO 80204, USA

Abstract

We explain why China is a "chaotic" or "strange" attractor of FDI. It is an "attractor" because its FDI inflows increased steadily even though the world FDI inflows have decreased considerably in recent years. It is indeed "strange," since its rates of FDI return are below the world average and predictions of its economic collapse are abundant. We find that Hong Kong and Taiwan are predominant players (40 to 60% of total FDI), followed by the United States and EU, and the size of investment is generally very small. The concept of the China Circle should be expanded to the East Asia Circle, which is experienced by Taiwan and Korea in earlier decades. We also considered some important characteristics, including the regional distribution, geographic proximity, and cultural similarity of these countries. To avoid spurious regressions, we use panel unit root and cointegration tests developed in the last few years. The results from panel data regressions explain our observations quite satisfactorily.

JEL classification: F21; F23; C23; O53; F41

Keywords: FDI in China, Determinants of FDI, Economic Crisis in China, Cultural Similarity, Panel unit roots and Cointegration tests

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1. Introduction

A "chaotic attractor," also called a "strange attractor," is a mathematical term referring to a special set to which dynamic trajectories converge (are attracted). There trajectories are sensitive to initial conditions in that two nearby trajectories follow essentially different paths

*Corresponding author. Tel.: 303-492-7908; fax: 303-492-8960.
E-mail address: hsiao@spot.colorado.edu; mei-chu.hsiao@cudenver.edu

after a short time (strange), and their paths cannot be predicted (chaotic) (Gabisch and Lorenz, 1989). This paper uses the term figuratively, and, as a first step, investigates its statistical implications. In examining the world trend of foreign direct investment (FDI), we have found that despite a considerable decrease in world FDI inflows in almost every region and country in the past two years, the inflows to China[1] have increased considerably (attractor), despite the dire institutional defects, corruption, and numerous predictions of upcoming collapse of the Chinese economy (strange), and thus the future of FDI inflows to China cannot be predicted (chaotic).

As we will review below, in recent years there have been a few papers and book chapters dealing with China's inward foreign direct investment. However, our paper differs from the current literature in several respects. First, instead of simply listing the data, we classify China's FDI inflows in a comprehensive and meaningful way. In particular, the inclusion of Taiwan in the group of Asian developed countries enables us to better understand the nature of China's FDI inflows and to relate the success of China with that of Taiwan and Korea in the 1980s. Second, we try to explain large FDI inflows to China despite its perceived crisis and low rates of return on investment, which are inconsistent with business and economic sense. Third, we pointed out that, probably due to great risk factors, the average size of FDI per case is generally small for investors not only from advanced Asian countries and Hong Kong, but also from the United States and EU. Fourth, we emphasize the most recent development, 1990 to 2002, the period during which China fully opened its domestic market.

Fifth, instead of dealing with a large cross-section of heterogeneous countries, after a careful discussion, we concentrate our studies on five countries, which have invested heavily in China. In particular, we include Taiwan as well as Hong Kong in our studies, as these two economies constitute over 60% of China's FDI. Due either to data collection or political ideology, Taiwanese investment in China has been generally ignored in the literature on FDI in China. Sixth, in order to avoid spurious regressions, this paper draws upon advances in panel data analysis developed in the last few years. It combines testing for unit roots and cointegration from time series with power from cross-section to form a panel data analysis. Finally, for the first time in the literature, our panel data fixed effects model explains both the conventional determinants of FDI and the perceived economic and political crisis in China.

In Section 2, we first show the world trends of FDI inflows to developed and developing countries and various regions, especially South and Southeast Asia countries, using the detailed

UNCTAD data. In Section 3, we explain why China has been a "strange" attractor, that is, despite predictions of imminent or near future collapse of its economy, it has still attracted massive FDI. We then, in Section 4, identify the major investors in China, and examine their country or ethnic characteristics in Section 5. Based on these findings, in Section 6, we propose a panel data analysis, after a brief review of current literature on the determinants of FDI. Section 7 concludes.

2. The world trend of FDI – China as an attractor

China opened her 14 coastal cities (Dalien, Qingdao, Shanghai, etc) only in early 1985, and published the "Regulation on Encouraging Investment by Foreign Firms" in late 1986 (CPCB, 2002, 67). But the economic reform and FDI intensified only after Deng Xiaoping's southern tour in early 1992. Thus, FDI in China is a recent phenomenon (see the columns of Figures 1 and 2, which are explained below). Table 1 shows the amount, growth rates, and world share of FDI in major regions and countries[2] from 1991 to 2002. Levels are shown in bold face and in billions of US dollars. The FDI inflow average during the recent period (1997-2002) was US$ 853 billion per year, which is a 235% (or 3.35 times) increase over the annual average of US$ 254 billion of the earlier period (1991-1996). Thus the world FDI increased rapidly. However, it also fluctuated abruptly. It almost tripled from US$ 482 billion in 1997 to US$ 1,400 billion in 2000, but fell more than 50% to a mere US$ 650 billion in 2002. The coefficient of variation[3] is 39%. Thus, the world capital inflows have been volatile in almost all regions and countries. Table 1 shows that volatility has been higher among the developed economies, which have accounted for, on average, 73% of the world FDI inflows. The United States (62% CV) experienced the greatest fluctuation, then Japan (52%), followed by the European Union (50% CV).

Place Table 1 here

By comparison, the volatility in developing economies is subdued (15% CV), although their aggregate world share of FDI inflows has averaged only 24% in the recent period. The ASEAN5 countries (Indonesia, Malaysia, Philippines, Thailand, and Vietnam) as a whole have consistently lost FDI inflow since 1997, except in 2002, and have fluctuated substantially (63%

CV), although their world share has been about 1% in the recent period. The FDI inflows to the NIEs (Asian Newly Industrializing Economies: South Korea, Taiwan, Singapore, and Hong Kong), have increased considerably between the two periods, except for Singapore, but they also have had a higher degree of fluctuation, especially Hong Kong and Taiwan. Their fluctuation has even exceeded that of the developed economies. The sudden increase in FDI in Hong Kong and Taiwan in 2000 might be due to foreign firms' anticipation of emerging opportunities in China after China's accession to WTO, and their desire to "park funds" in Hong Kong and Taiwan.[4] After 2001, these funds have gone directly into China rather than "routing" through Hong Kong and Taiwan, explaining the drastic decrease in FDI in these two economies in the subsequent two years. A similar explanation may be applied to the decrease in FDI in Korea and Singapore in 2001 and 2002, after their FDIs relocated to China.

China and India are two major exceptions in the world. FDI inflows in both countries have increased steadily since 1997, except for a slight decrease in 1998 and 1999, and both countries showed an increase in FDI inflows even during 2001 and 2002. Comparing the two periods, Chinese FDI increased only 76%, and Indian FDI 170%, and China had the smallest volatility (10% CV) among the regions and countries in Table 1 during this period. However, in terms of world shares, India had consistently less than 1%, while China attracted 3% to 10% of world FDI. In 2002, Chinese FDI inflow was US$ 52.7 billion, 8.1% of the world share, greatly exceeding the inflow to the United States, US$ 30 billion, which was 4.6% of the world share. In other words, when the developing countries, especially the governments in the Asia-Pacific regions, were starving for FDI during 2001 and 2002, China alone attracted as much as a quarter to a third of the foreign capital flowing into developing economies.

3. The strange attractor

What makes China so attractive for FDI, and who are the major investors in China? It is certainly not attractive because of the high rate of return on FDI. Table 2 shows the rates of return based on FDI income divided by the average FDI stock between the beginning and the end of the year (UNCTAD, 2003, Annex). For individual investment projects, the average return on FDI in China from 1999 to 2002, was 5.9%, lower than the world average of 6.5% as well as the developed countries average of 6.7%, and only about 1.5% higher than the developing economies average of 4.4%. Among the 10 Asian countries listed in Table 2, the return from

FDI in China[5] was 5.9%, much less than the average returns of these 10 countries, 7.7%, and less than 50% of that in Hong Kong (12.5%), Malaysia (12.3%), Papua New Guinea (11.3%), and Philippines (7.3%). More generally, to see the low rates of return on investment in China from another angle, Table 3 shows the returns (q_m) on corporate investment (not necessarily FDI) as a fraction of the costs of capital[6] in 47 countries (Gugler, Mueller, and Yurtoglu, 2003). China's return on investment was mere 45% of its cost, ranked 43rd, much lower than those of ASEAN4, and only about one-half of that of India. For comparison, we also include the rates of return on investment in some South American countries. Except for Brazil and Peru, their rates of return were also higher than those of China. Despite the low rates of return on investment, China has attracted a great deal of FDI, as we have seen in Table 1, while all other countries were not attracting, or even losing, foreign capital, especially Hong Kong. Apparently, the law of supply and demand of foreign capital has not been working in the Chinese case.

Place Tables 2 and 3 here

Praise of the achievement of China's economic reform and development, and its accession to WTO in December 2001, have undoubtedly fostered the expectation of a "1.3 billion consumer market" (Studwell, 2002). However, massive official corruption[7] and governance deficits (Pei, 2002), weak infrastructure, high urban unemployment (15%, BW, 2004; Formey, 2003), a huge national debt (176% of GDP, Business Week, 2004), enormous non-performing bank loans (45% of outstanding loans, Business Week, 2004; Lague, 2002), a fragile banking system (ibid.), an agricultural crisis (Wolf, et al., 2003), etc., in China are often given as reasons of possible future economic crisis and even collapse in China. In addition to anecdotal horror stories in Chang (2001), Studwell (2002), and Chan (2004), Wolf, et al. (2003) recently have examined nine potential adversities that China will face over the next decade. Their separate effects of diminishing China's economic growth rates are (percent in parentheses): HIV/AIDS and epidemic disease (1.8-2.2); water shortage and pollution (1.5-1.9); energy shortage (1.2-1.4); Taiwan and other potential crises (1.0-1.3); possible shrinkage of FDI (0.6-1.6); fragility of the financial system and state-owned enterprises (0.5-1.0); corruption (0.5); unemployment, poverty, social unrest (0.3-0.8).

Furthermore, a recent Global Competitiveness Report by World Economic Forum (WEF, 2003) ranked China's economic prospects over the next few years as 44th out of 82 countries in the world, due to its deteriorating public infrastructure, severe political corruption, and underdeveloped legal system, etc. China ranked[8] far below Taiwan (5th), Singapore (6th), Korea (18th), Hong Kong (24th), Malaysia (29th), and Thailand (32nd). With these potential economic, social, and political problems or disasters, it is indeed "strange" that China still can attract so much FDI.

4. The major players

Who are the players in China's capital market, and what are their motives? Table 4 shows the major players in China's actual (instead of approved) FDI market,[9] based on Chinese sources. The data consist of cases in 1,000, amount in US$ million (m) or US$ billion (b), and the size (amount per case) in US$ million. Levels are in bold face fonts. They are divided into the cumulative FDI up to 1999, and the FDI in 2002. The data are then grouped into six regions. We define the Asian developed countries (ADC), consisting of Japan, Taiwan, Singapore, and Korea. As usual, if Hong Kong is added, we denote it as ADC+. The cases and amount of FDI from Macao are very small compared with those from Hong Kong; nevertheless, we have listed Macao in the ADC+ group for reference. Other regions include North America, consisting of the United States and Canada; the ASEAN4, consisting of Ma1aysia, Thailand, Philippines and Indonesia; the European Union, including UK, Germany, France, Netherlands and 11 others[10]; the Free Ports of Virgin Islands, Cayman Islands and Western Samoa; and lastly, all "Other Countries." For each category, the total ranking (rkg) of 31 economies (including separate Hong Kong and Macao) is given at the right-hand side of each number. Inside each region, the countries are ranked according to the descending order of the up-to-1999 amount.

Place Table 4 here

Up to 1999, about 342 thousand cases and US$ 308 billion were invested in China. Most of them were of very small size, on average US$ 0.9 million per case, or no more than US$ 2 million per case.[11] In 2002 alone, 34 thousand cases and US$ 53 billion were invested, and the

average size of the investment increased to US$ 1.5 million, an increase of 50%, but still a very small amount indeed.[12]

Note also that the percentage distribution and the rankings of the cases and amounts for most countries in the list in 2002 did not change much compared with the corresponding cumulative cases and amount up to 1999.

At a disaggregate level, Table 4 shows that, up to 1999, 86% of the cases and 75% of the total amount came from the ADC+, and Hong Kong alone contributed about half of the total cases (54%) and amount[13] (50%). This predominance has decreased recently, but Hong Kong still had 31% of total cases and 34% of total FDI in China in 2002. The size of the Hong Kong investment doubled in 2002, to US$ 1.6 million, indicating a closer tie between China and Hong Kong, but, due to a general increase in the size of investments from other countries, its ranking improved only from 18th to 14th.

The Japanese and Taiwanese investments were a distant second, slightly less than 8% of the total amount for each country up to 1999 and also in 2002, but the number of Taiwanese cases (13% to 14%) was consistently twice as large as the number of Japanese cases (6% to 8%), implying that the Taiwanese investment was much smaller per case. In fact, the size of the average Taiwanese investment was the smallest among the countries, a mere US$ 0.5 million to 0.8 million, ranking at the bottom 27th or 30th among the 31 countries in Table 4, and reflecting, perhaps, the political risk and instability between Taiwan and China across the Taiwan Straits.

The other members of ADC+, Singapore and Korea, played relatively minor roles, but their rankings were still high among the major investors. The average size of a Singapore investment ($1.7 to $2.5 million) was the largest among the ADC+, larger than that of Japan ($1.3 to 1.5 million), but not as high as investments from major EU countries, and the size of an average Korean investment was consistently smaller ($0.7 million), closer to that of Taiwan.

Beside the ADC+, the major sources of FDI were the USA (about 10% in cases and amount), the EU (about 3 to 4% in cases and 7% in amount), the Free Ports and "Others." The average size of a EU investment was almost twice that of a USA investment. As expected, investment from the ASEAN4 was negligible, less than 2% of total cases and amount.[14] In terms of size, investment from the Free Ports was the largest, ranging from US$ 3 million to US$ 6.3 million, exceeding the sizes from other areas or countries. In 2002, FDI from the Free Ports was as high as 15.5% of the FDI into China. These free ports are tax-free refuges for foreign funds

and their FDI may have consisted of private "returned" funds from anonymous sources in China, Hong Kong, or Taiwan.[15] The size of the EU investment was also relatively large, larger than that of the USA. However, four countries, UK, Germany, France, and the Netherlands, dominated the EU investment. Investment by other EU members was generally small in amount and size, roughly comparable with those of ASEAN4.

In general, Table 4 shows that the predominant players in the FDI inflows to China have been the ADC+, especially Hong Kong and Taiwan, and the others have been the United States and the EU as a whole. Figures 1 and 2 show the time series trend of the cases (Figure 1) and the amount (Figure 2) of FDI inflows to China from Hong Kong (shown by a solid line, including the data on Macao), Taiwan (a solid line), Japan (a solid line with circle markers), and the United States (a dotted line), and EU (a heavy solid line), all measured from the left-hand side axis, and also the total FDI inflows to China in columns, indicated in italic and measured from the right-hand side axis. As expected, since Hong Kong's investment consisted of more than 50% of the total FDI, the shape of the total FDI columns in both figures roughly follows the shape of the Hong Kong FDI. The earlier the data, the stronger this coincidence, especially before 1991, indicating the exclusive contribution to the Chinese economy of Hong Kong investment to China. After 1992, investment from Taiwan, Japan, and the USA increased, and the US investment caught up with that of Taiwan in 1995 and Japan in 1998, while EU investment caught up with all three in 1997, although it tends to go under in recent years. Meanwhile, investment from Hong Kong started decreasing after 1997 after Hong Kong was returned to China.

Place Figures 1 and 2 here

The dotted line with triangle markers in Figure 2 shows the size of overall FDI in units of US$ 100,000. The overall size was US$ 1.5 million in 1986, but it steadily decreased to about US$ 0.2 million in 1992, showing the influx of a great number of small and medium enterprises (SMEs) from Hong Kong (Figure 1). The size then increased steadily until 1999 to about US$ 2.3 million, due to a faster increase in the amount of total investment, then decreased again to US$ 1.5 million in 2002, due again to influx of mostly SMEs from Hong Kong and Taiwan.

Figures 3 and 4 show the proportion of the five leading investors in the total FDI from 1986 to 2002. It is clear that before 1992, the five investors dominated the scene, and the

proportions of cases (Figure 3) and amounts (Figure 4) were maintained rather steadily. After 1992, the contribution from other countries and regions increased. However, the three leading investing countries, Taiwan, Japan, and the USA, maintained more or less the same proportions through out the years. Apparently, EU and Other investors expanded in the Chinese capital market at the expense of Hong Kong/Macao investors. The trend appears to continue in the near future.

Place Figures 3 and 4 here

Figures 3 and 4 and Table 4 vividly show the existence of the so-called "China Circle" (Naughton, 1997), or, what we prefer to call, the "East Asia Circle," centered on Hong Kong. The inner layer of the circle consists of Hong Kong and China. Taiwan and Singapore form the intermediate layer, and Japan and Korea form the outer layer of the "East Asia Circle." An outer-outer layer consisting of the United States and major EU countries then wraps up this circle. The formation of the layers may be explained by the "predatory" nature of capitalism: Japan was developed in the early prewar period by trading with the United States, and Japanese FDI then moved to the NIEs in the 1960s and the 1970s, especially to Taiwan and Korea (Hsiao and Hsiao, 1989, 1996, 2002, 2003). After the NIEs grew to ADC+ in the 1980s and the 1990s, they found opportunities in nearby China. All these developed countries have now flocking to China, or started "exploiting" China.[16] In fact, this phenomenon is nothing new. It occurred to Taiwan and Korea from the 1970s to the 1990s (Hsiao and Hsiao, 1996, 2003), while the Chinese, Indian, and Latin American economists were condemning "American and Japanese imperialism" and FDI, which was seen as the vanguard of "imperialist capitalism." History seems to be repeating itself, except that those economists are now forgotten.

We now return to our original question: Why China now? Why not India or the ASEAN countries?

5. Some characteristics of FDI to China

We have seen that Chinese FDI inflows are dominated by the ADC+, and much less by US and major EU investors. Table 5 shows the geographical distribution within China of the cases and amount of FDI, arranged in descending order of the up-to-1999 amount. Almost all

FDI inflows were concentrated in the Eastern Region: 80% of the cases up to 1999, which increased to 85% in 2002; 86% of the amount up to 1999, which increased slightly to 87% in 2002. The size of investment also increased from US$ 1.0 million to 1.6 million. The Central Region (12%), and then the Western Region (7%), followed the Eastern Region in ranking. In the Eastern Region, the investment was further concentrated in Guangdong, Jiangsu, Fujian, and Shanghai Municipality. These four locations alone consisted of 50% to 60% of cases and amount, and they are geographically close to the two major investors: Hong Kong and Taiwan. They, in general, had a larger size per case than the average size of the whole Eastern Region.

Place Table 5 here

The investments in the Eastern Region were further concentrated in five major cities within these provinces, as shown in rows 15 to 19 in Table 5: Shenzhen in Guangdong,[17] Xiamen in Fujian, etc. The concentration of FDI in these five cities even exceeded some of the provinces as a whole in the Eastern Region. Combined with the data for the ADC+ in Table 4, it appears that Guangdong, especially Shenzhen, served as the natural hinterland for Hong Kong Chinese, who speak Cantonese, and Fujian, especially Xiamen, served as the natural hinterland for Taiwanese, who speak South Fujianese. The Japanese and Koreans favored the Northern coastal provinces and cities, like Shandong and Liaoning.[18] The American and EU investors favored modern political and economic centers like Shanghai, Beijing, or Tianjin, in addition to Guangdong, which is closer to branches in Hong Kong. Thus, because of these unique geographical proximities and language and cultural similarities with neighboring investors,[19] which have lowered the transaction cost of investment, as well as other factors proposed by neoclassical theory, China has been able to attract various investors.[20, 21]

These various investors also found division of labor in China. Table 6 shows the approved (not actual) FDI by industry and the size per case using the Chinese sources. The actual investment by industry is available only for 2002, and only the approved amount of 2002 is available. Table 6 shows that the actual FDI was only about a half of the approved FDI in 2002, consistent with our previous observation, although the difference in percentage distribution is much smaller.

Place Table 6 here

In Table 6, from 1979 to 2002, the total approved cases were about 424 thousand, and the amount was US$ 828 billion, while in 2002 alone there were about 34,000 cases and US$ 53 billion. The average size was US$ 2.0 million, more than double the average actual investment size (US$ 0.9 million) from 1979 to 1999, shown in Table 4, although the actual size in 2002 remained the same (US$ 1.5 million). Despite the difference between approved and actual FDI, the FDI projects are apparently becoming larger and larger recently. The accumulated investment in approved amount was 2% into primary industry; 68% into secondary industry, of which 63% went to manufacturing; and 30% into tertiary industry, of which real estate and public service received the lion's share (22%).

The size of the investment also varied. The investment in "health, sports, and social welfare" ($ 4.6 million) was the largest, although the total amount in this category was negligible (1%), followed by "real estate and public services" ($ 4.0 million), and "transportation and communication" ($4.0 million). On the other hand, the size of investments in "trading and restaurants" ($1.2 million) and "manufacturing" ($ 1.7 million) were the smallest, along with "science and technology" ($ 1.1 million) and "education, culture, and arts" ($ 1.6 million), although the total amount of the last two categories were also very small (both are less than 0.5%).

Comparing these sizes with the sizes of country investments in China in Table 4, a clear picture appears: The EU and Free Ports, and to a lesser degree Japanese, investments were most likely to be in "real estate and public services," followed by "transportation and communication," and a negligible amount went in "health, sports, and social welfare." On the other hand, the Hong Kong, Taiwanese, and Korean investments went into trading and restaurants and small-scale manufacturing, or into small research facilities in science and technology. Thus, each layer of the Asian circles found its niche in Chinese markets.

Another characteristic of FDI in China was that exports by the FDI firms that exported US$ 10 million or more comprised about 57% of the total FDI exports, or 26% of China's total exports in 1999 (the last two columns of Table 7). In other words, Table 7 also implies that the smaller foreign firms (including joint venture) that exported US$ 10 million or less altogether made 43% of total FDI exports! Thus, if we include the smaller exporters, it is clear that China's

vigorous export activities were indeed supported by FDI: About half of China's total exports were made by FDI (CPCB, 2002, 6). Furthermore, from Table 5, among the FDI firms that exported US$ 10 million or more, firms that had annual exports of US$ 10 to 30 million and those above 100 million did most exporting. Hence, both small and large firms have exported the same percentage of total FDI exports (19% to 20%) or total national exports (9%). Thus, small firms also engaged vigorously in export activities.

The firms with annual exports above 100 million grew very fast, 37% from 1998 to 1999, and they had much larger export capability per firm: US$ 212 million as compared with a mere US$ 16 million for those firms which exported between US$ 10 and 30 million in 1999. This shows that in recent years the larger FDI firms, in addition to aiming at the domestic markets, have also been taking advantages of lower cost of labor and land, and engage in export activities.

Place Table 7 here

The uniqueness of the Chinese FDI policy is that it has allowed FDI flows into the business of trading and restaurants, real estate, and small-scale manufacturing, which compete directly with local business,[22] and are generally frowned upon by other governments. This policy has resulted in massive inflows of small capital from Hong Kong and Taiwan. There may have been political motives[23] on the part of China to lure the Hong Kong Chinese and the Taiwanese into the "China Circle" for future "unification," but, in any case, we have to take into account this unique FDI policy that is not seen in other countries.

We submit that the smallest size of investment by Taiwan and Korea (merely $ 0.5 to 0.8 million) among the various countries (Table 4), reflected a rational behavior, especially by the Taiwanese.[24] They internalized political risk and invested only a small amount.[25] From the Taiwanese point of view, the main purpose was to take advantage of lower transaction costs (in terms of geographic proximity and language and cultural similarity) and much lower wage rates (about one-tenth of the Taiwanese rates in early years), which enable them to earn quick profits from exports within a year or so.[26] Our findings for Hong Kong and Taiwan are consistent with Wheeler and Mody (1992) and Raff and Srinivasan (1997), theorized in Janeba (2002), that, although for different reasons from ours, political risk plays a lesser role in the determination of FDI. Furthermore, their quick profits could be realized easily if their contractors and

subcontractors also moved to China (the agglomeration effect). This explains, despite the political risk, the increase in the size and amount of investment from these two countries in recent years (Table 4), and also explains the investment from Hong Kong (Figure 2).

These attitudes and calculations are reflected in various surveys of ADC companies who invested in China. Table 8 shows survey results of the reasons for investment in China. In 1998, in Taiwan's survey of the automobile parts industry invested in China, as much as 86% and 64% of the firms, respectively, wanted to take advantages of lower production cost and easier access to the resources, while 64% was attracted by new market opportunities. Thus, lower production cost and easier access to resources were the predominant reasons for investment. Similar results were obtained in Japan's 2001 survey (78%) and Korea's survey (43%). For these firms, the new market opportunity were not as important, as shown by a comparison of Taiwan (64%), Japan 2001 (55%), and Korea (36%). Only in the 1986 survey of Japan it was indicated that new market opportunities played a predominant role (82% versus 23%). This was because, in the early years, only the larger Japanese MNC invested in China. Other reasons, like following own and other industries (the agglomeration effects) appear to be recent phenomena and of secondary importance for the Japanese FDI, while increasing exports and China's FDI policy (tax holidays, etc.) were not important for the Korean FDI. Thus, the survey results show that the major variables in conventional theory of FDI, low labor cost and market opportunity, have still held in the case of China with different degrees of emphasis.

Place Tables 8 and 9 here

Table 9 shows a survey of problems faced by the Taiwanese and Japanese FDI firms in China. The basic problem appears to be the confusing legal system (68% for Taiwanese and 53% for Japanese), which may result in corruption (45%) and administrative inefficiency (64% and 14%). These are consistent with some of the reasons of incoming economic crises expounded in Section 3 above.

6. A panel data analysis

Conventional analysis of FDI has been based on FDI among the developed economies, or from developed countries to developing countries. There are two types of multinational

corporations (MNC). Vertical MNC locate production units in different countries to take advantage of lower factor prices, especially wage rates, at certain stages of production (assembly and packaging, Helpman and Krugman, 1985). Horizontal MNC locate the production of similar products and firms in other countries to avoid trade restriction and expand the market (Horstmann and Markusen, 1992). Recently, Markusen, et al. (1996) proposed a knowledge-based capital MNC model, allowing the possibility of both vertical and horizontal MNC models. To consider special features of FDI inflows to China, such as geographic proximity and cultural/ethnic similarity (as examined in Sections IV and V), Rauch and Trindade (2002) and Gao (2003) have recently incorporated ethnic Chinese networks into their FDI inflow models of China. In their cross-section analysis, one of their cross-section variables is the geographical distribution of ethnic Chinese in about 70 countries. In our view, however, as Table 4 shows, this is quite irrelevant, as only the ADC+, predominantly Hong Kong and Taiwan, and to a lesser degree Singapore, are the almost exclusive investors. Furthermore, their analyses did not take time variation and interaction between the countries into consideration, as shown in Figure 2, resulting in a great loss of information.

In a recent conference paper, Kerr and Peter (2001) have proposed a time-series analysis of the determinants of FDI in China. Using the Chinese data alone, they find that the coefficients of wage level, exchange rates, interest rates, tax regime, and the degree of openness have "expected signs" and are significant. But their model does not consider the size of the market, geographical proximity, or cultural similarity and ethnicity in the model, although these factors play important roles in the cross-sectional analysis.

In this paper we propose a panel data analysis, which has the merit of using information concerning cross-section and time-series analyses. It can also take heterogeneity of cross-section data explicitly into account, by allowing for individual-specific effects (Davidson and MacKinnon, 2004), and give "more variability, less collinearity among variables, more degrees of freedom, and more efficiency" (Baltagi, 2001). Furthermore, the repeated cross-section of observations over time is better suited to study the dynamic of change like FDI inflows.

In recent years, there are several papers on FDI inflows to China using panel data analysis. These are ably reviewed and expanded in Wei and Liu (2001). Their panel data for realized FDI consist of 29 countries (not including Taiwan), which comprise 88% of total FDI into China from 1984 to 1998, with nine independent variables in logarithms, all of which,

except the relative exchange rates, are found to be panel stationary at levels. Since their independent variables include time-invariant variables like geographic distance and "total cultural distance" (inappropriately using Taiwan as proxy for China), to avoid multicollinearity, the regression coefficients are estimated by using OLS and the random effects models. They find that relative wage rates, relative market size, exports, imports, country risk, and cultural differences are highly significant in determining FDI inflows to China. However, relative real exchange rate and geographic distance are not significant.

In our panel data analysis, based on Table 4, we concentrate our analysis on only five major investors from Hong Kong, Japan, Taiwan, Korea, and the United States, which together comprise 84% of FDI cases and 77% of FDI amount before 1999, and 74% of total FDI cases and 65% of FDI amount in 2002. Our purpose is to find the determinants of FDI in China by the major investing countries by grouping cultural factors and political and economic risk together in the fixed effect model of the panel data analysis, using unbalanced panel data[27] from 1986 to 2002. Based on the theory of MNC, as explained above, and recent study of FDI in general, our dependent variable is the log-value of FDI to China (FDI), which is deflated by China's GDP deflator. The independent variables include market size (GDPX), wage differential (WRATIO), and openness (OPEN). We also include real exchange rate (EXRATE) as the financial variable, as it is considered to be one of the important financial determinants of international capital flows. These four variables are explained briefly below.

First, we have the two economies' interaction variable, GDPX (in log value), which is the product of the i^{th} economy's real GDP and China's real GDP, each being deflated by its own GDP deflator. This variable measures the size of markets as envisioned by the horizontal MNC model, and has been used in Rauch and Trindade (2002), although they appear to have a hard time rationalizing its use. Our assumption here is that after taking the logarithm of the product of two economies' GDPs, we may make an elasticity interpretation: one percent increase in China's real GDP and one percent increase in the home country's real GDP have the same percentage impact on FDI flows to China. We may think of a kind of equilibrium situation in which, since the products of FDI in China can be sold either in Chinese markets (horizontal MNC) or exported to the home country (vertical MNC), the effect of percentage change in market size, whether it is of the host country or of the home country, on the percentage change in FDI is the same.

Second, we have the logarithm of the ratio, WRATIO, of the real annual wage of the home country over that of China, the annual wages being deflated by the consumer price indexes of each country. This ratio captures the advantage of factor differentials as emphasized by the vertical MNC model. Rauch, et al. (2002) and Gao (2003) use the logarithm of GDP per capita between the i^{th} economy and China as the proxy for the wage/technology differential. However, since this proxy can be interpreted in many ways, and since real wage statistics are available, this study does not use the proxy.

Third, we have the variable of openness (OPEN). This is measured by the logarithm of the ratio of the sum of China's imports from the i^{th} economy and China's exports to the same economy divided by China's GDP. This variable measures the perceived openness of the individual country regarding the Chinese market. It is found to have the strongest influence on general FDI inflows by Lipsey (2000).

The last variable is the logarithm of the real exchange rate, EXRATE, which is the nominal RMB per unit of the i^{th} economy's nominal currency multiplied by the ratio of i^{th} country's consumer price index over China's consumer price index. Theoretically, this variable is an important determinant of international capital flows in the financial market (Hsiao and Hsiao, 2001), although its effects on FDI are complicate and the direction of influence on FDI is not well established.

In the dynamic analysis, we include a one-period lagged dependent variable, FDIP, to account for the effect of agglomeration of FDI, that is, the flows of FDI depend on the amount of existing FDI in the previous period. This is indicated as the fourth FDI motives survey of firms presented in Table 8.

A. Panel unit root and cointegration tests

Before we make an estimation, we have to test the unit root for the panel data of six variables. There are several methods of testing unit root under panel data setting. We have chosen three common procedures: Levin, Lin, and Chu (2002) t* panel unit root test (LLC); Im, Pesaran and Shin (2003) W-test (IPS); and ADF-Fisher Chi-square panel unit root test (ADF-Fisher) by Maddala and Wu (1999). In all these tests, the null hypothesis is that of a unit root. The test results on the six series are mixed and are reported on the left-hand side of Table 10. All these tests show clearly that FDI and FDIP are stationary (no unit roots) at least at the 10%

level of significance, but GDPX and WRATIO are nonstationary. The variables OPEN and EXRATE have mixed results. Since two of the tests indicate that OPEN is stationary at least at the 10% level of significance and the p-value of the ADF-Fisher test is only 13%, which means it is very close to the 10% level of significance, we may consider OPEN stationary. This is not the case for EXRATE, as two of the tests indicate unit roots with very high p-values. Thus, we may consider it a nonstationary series.

In short, we have three nonstationary level series: GDPX, WRATIO, and EXRATE. The right-hand side of Table 10 then presents the tests of the unit root of the six first-difference series. All three tests indicate that all the first-difference series are stationary, that is, they are all integrated of order zero, I(0), and so, all the nonstationary level series, GDPX, WRATIO, and EXRATE, are integrated of order one, I(1). This result enables us to go a step further to test panel cointegration of these three level series.

The upper part of Table 11 shows the conventional Johansen cointegration tests for these three variables for individual country. The test results indicate that the three variables are cointegrated in all cases. The last two rows show the Fischer Chi-square test, which aggregates the p-values of individual Johansen cointegration test statistics into the panel cointegration test (Christopoulos and Tsionas, 2003). The Fisher test results clearly show that all three variables are strongly panel cointegrated at the 1% level of significance. The evidence for cointegration is sufficiently strong that we do not have a spurious regression problem. This justifies our use of the six level series in the following panel regression analysis.

Place Tables 10 and 11 here

B. The fixed effects regression model

The fixed effects model (FEM) with the dependent variable FDI and the four observed regressors, GDPX, WRATIO, OPEN, and EXRATE, is specified in equation (1) below:

$$FDI_{it} = \alpha_i + \beta_1 GDPX_{it} + \beta_2 WRATIO_{it} + \beta_3 OPEN_{it} + \beta_4 EXRATE_{it} + \varepsilon_{it}, \qquad (1)$$

where t denotes the time-series in the i^{th} economy's cross-section unit. The FEM assumes that each intercept, α_i, takes into account the influence from unobserved variables like cultural similarity, ethnicity, geographic proximity, political and economic risk, which may differ across the individual cross-section units. α_i does not vary over time. In addition, the FEM assumes that

there are common slope coefficients, β_1 to β_4, in equation (1) for the five cross-section units as a whole.

The left-hand side of Table 12 presents the estimated results from the FEM using all 73 unbalanced observations[28] (1987 to 2002 for Hong Kong, Japan, and the US, 1990 to 2002 for Taiwan, and 1991 to 2002 for Korea) from the five cross-section units. We find that all four common slope coefficients are positive. The first three coefficients are highly significant at the 1% level. However, the coefficient of the exchange rate (EXRATE) is significant at the weak 17% level. For example, β_1 is the estimate of the GDPX elasticity of FDI. This means that when the GDPX increases by 1%, the FDI to China from each country increases by 1.4%, that is, the larger the economy and the market interactions the higher the FDI inflows to China, and the elasticity is greater than 1. The coefficient β_2 (0.779) of WRATIO means that the wage differential between the i^{th} economy and China has a strong influence in attracting more FDI to China. The coefficient β_3 (0.75) for OPEN is positive and significant at the 1% level. Thus, the higher the openness ratio in China the more FDI inflows, with the elasticity being less than 1. It also indicates that FDI and trade are complementary, rather than substitute, in China, as can be seen partly from Table 7. Lastly, the coefficient β_4 (0.576) for EXRATE is significant at the weak 17% level. This result is expected because China's RMB is pegged with the US dollar, and has very few variations in the exchange rate data during the past few years, and thus it has had little effect on FDI to China.

We also find that the estimate for each intercept α_i, the fixed effect for each country, is significant at the 1% level. This means that there are some qualitative unobservable variables, such as cultural similarity and ethnicity, economic policy, political factors, potential crises, etc., as we have explained in Sections 3 and 4, which play very prominent roles in determining FDI to China. Conceivably, cultural similarity and ethnicity have a positive effect on FDI inflows from Hong Kong and Taiwan, and to a lesser degree from Korea and Japan, and favorable economic policy and political measures encourage FDI inflows for all home countries. Detractive factors such as massive corruption, huge national debt, the fragile banking system, etc. have negative effects on FDI inflows. The significant negative intercepts for all countries in Table 12 indicate that these negative factors override the positive factors decisively, and that there are lower limits (or thresholds) of market size, low wage, and openness before positive FDI inflows can take place. This seems to be reasonable interpretation. Note that Hong Kong, Taiwan, Korea, and

Japan, in that order, have smaller negative fixed effects than the United States. This would be because the United States, and to a lesser degree Japan, is unable to take full advantage of cultural similarity and ethnicity.

Place Table 12 here

We have also estimated the FEM in equation (1) using 60 balanced observations: 12 observations from 1991 to 2002 each from the five cross-section units. We find that the estimation results are very similar to the results in Table 12 using the unbalanced data sets. To save space, we do not present the results here. In addition to running the fixed effects model, we have also considered the random effects model. However, since our countries consist of ADC+ and the United States chosen from Table 4, not selected by random sampling from the population, it is not appropriate to estimate the panel regression using the random effects method.[29]

In general, our empirical findings support the theory that market size, wage differential, openness, and country characteristics, except for exchange rate, are the most important factors in attracting FDI in China for these five economies. [30]

C. Dynamic panel model

The dynamic model at the right-hand side of Table 12 considers the agglomeration effect explicitly by including FDIP, the one period lagged dependent variable as an independent variable in equation (1), that is,

$$FDI_{it} = \alpha_i + \beta_1 FDIP_{it} + \beta_2 GDPX_{it} + \beta_3 WRATIO_{it} + \beta_4 OPEN_{it} + \beta_5 EXRATE_{it} + \varepsilon_{it} . \qquad (2)$$

where FDIP is the past FDI which captures the motive for FDI firms which follow the investment of its own or other industry to invest in China. The estimation results show that the coefficient of WRATIO becomes insignificant and that of EXRATE becomes highly significant at the 1% level. The interpretation here is that if a firm follows its own and other industries in investing in China, the group externality accrued to the firm, like convenience in acquiring intermediate materials, information exchange, and increase in the firm's competition and bargaining power against the local labor, etc., may render low wage rates unimportant. On the

other hand, increase in investment projects after the firms follow each other in investing in China increases the export activities and competition, making the exchange rates important in determining FDI inflows.

The dynamic model also makes country characteristics, as indicated by the fix effects, insignificant for the ADC+, but not for the United States. The intercept o100f the USA is a negative large value and significant at the 5% level. This means that under the group effect, the negative factors still affect FDI inflows, but the impact on the ADC+ become less important and not significant. For the United States, cultural similarity and ethnicity, geographic distance to China, potential crisis in Chinese economy and society, etc., still work heavily against US FDI inflows to China.

Furthermore, we have also tried to estimate the autoregressive distributed lag model (ARDL) by extending the lag length of FDI to 2 and 3 as the independent variables in equation (2). The estimates are not much influenced by the additional lags of FDI.[31]

7. Conclusions

This paper examines why China has attracted so much FDI in recent years while the world FDI inflows to other countries have been decreasing considerably, and many developing countries have been starving for FDI. In fact, available funds for fast developing countries have apparently been redirected and reallocated to China. The attraction is not that China has higher rates of return from investment, nor that it is an economically, politically, or socially stable and competitive country. On the contrary, the predictions of its collapse, if not imminent, are abundant. Our statistics show clearly that over one-third to one-half of FDI has been from Hong Kong, the core of the "China Circle," followed by Taiwan and other Asia Developed Countries, that is, the "East Asia Circle," which was responsible for over 75% of total FDI in China from 1979 to 1999. Even in 2002, the total investment from ADC+ was 60%. However, the existence of the "East Asia Circle" is not new, nor "strange;" it happened to Taiwan and Korea, during the "Miracle Growth in East Asia" decades ago (Hsiao and Hsiao, 2003). Thus, as before, the "attraction" has been due merely to language and cultural similarity, geographic proximity, and historical ties. In fact, it is often asserted that the US and European investments in China have been "surprisingly small" (Zhang, 2000; Wei, 1998).

We also find that, while the amount of foreign investment in China has been large, the size of investment per case has been quite small, merely one to two millions in US dollars, internalizing the political and social risk in China. Another evidence of uniqueness is that the ethnic investments have been concentrated in China's Eastern coastal cities and region, roughly distributed along the line of linguistic similarity and geographic proximity, and FDI inflows have shown a division of labor among themselves: The Hong Kong and Taiwanese firms finding niches in trading and restaurants and small-scale manufacturing, and the American and EU firms in large scale real estate, public services, transportation, and communication.

To evaluate the determinants of FDI in China, instead of applying the cross-section or time-series analysis, we propose a panel data analysis. After testing panel unit roots and cointegration to ensure no spurious regressions, the estimation results show that the fixed effects are negative and highly significant for each and every country, implying that although China appears to be the "chaotic" or "strange" attractor of FDI, the investors from foreign countries are not "strange," rather, they are, after all, rational, as they apparently have taken into account the dire predictions of possible crisis in the Chinese economy. The estimation results also show how the dire predictions could take place: there is a possibility of sudden stop of capital inflows (Calvo, 1998) to China when real income, wage differential, or the degree of openness falls below certain threshold levels. Furthermore, if some of the potential adversities that China might face (Wolf, et al. (2003) come true, or the investors were indeed allured to the expectation of "1.3 billion consumers' market" and the boom in FDI turns out to be a bubble, then considering the extreme volatility of FDI inflows, as shown in Table 1, future FDI inflows to China indeed can not be predicted (chaotic).

The dire prediction notwithstanding, we found that, for the five countries as a whole, real market size and real wage differential affect FDI to China positively, consistent with the theory of horizontal as well as vertical models of MNC. The implication is that, admittedly, for the investors from the United States[32] and Japan, market size plays a more important role in investment decision, and for those from Hong Kong, Taiwan, and Korea, wage differential is a more important factor in deciding investment in China. When the data are aggregated, both variables have positive effect on FDI inflows to China in the static model, allowing the possibility of both vertical and horizontal MNC models. After all, the survey results of Table 8 also indicate both variables are important, although the importance of wage differential is

substituted by the agglomeration effect and exchange rate in the dynamic model. The positive effect of openness on FDI inflows indicates that FDI and trade are complementary. They grow together in the case of China, like the cases of Japan, Taiwan, and Korea a decade or two ago. The effect of change in exchange rate on FDI is positive, indicating Yuan depreciation will make labor and assets in China cheaper and increases FDI. The effect is weakly significant in the static model but highly significant in the dynamic model.

In general, while the conclusions of this paper must be qualified by the data and short time series, it appears that our fixed effects model can explain why China has been a "strange attractor of FDI," and why it is unpredictable or "chaotic." The estimation results explain our observations quite satisfactorily.

Appendix: Data sources

Hong Kong, including Macao, (HKM), Japan (JPN), and the United States (USA) have annual FDI data from 1986 to 2002, Taiwan (TWN) has annual FDI data from 1989 to 2002, all in US dollars, from China Statistical Yearbook and various official websites, in particular, http://www.mofcom.gov.cn (December 2003, in Chinese). Korea's annual data (KOR) from 1990 to 2002 are taken from Lee (2003). US GDP in billion US$ is from WDI (2003). GDP in billion US$ for other countries, China's imports from the home country, and China's exports to the home country, in billion US$, are taken from ICSEAD (2003). The GDP deflator and exchange rates (annual average rates) are from IMF (2003), except that Taiwan's data are taken from ICSEAD (2003). Wages in manufacturing (men and women) and consumer price general indexes (1990=100) are taken from labor statistics (LABORSTA), the International Labor Office website. Non-linear interpolation has been applied to the wage series of Japan and Korea.

Acknowledgement

We are grateful to ICSEAD and Professor Eric Ramstetter for making data available to the authors. We thank Professors Doowon Lee, Keith Maskus, Jaw-Yann Twu, Akio Yamashita, and Kevin H. Zhang who helped us in search of references. Comments by Professors Michael Plummer, T. N. Srinivasan, Manoranjan Dutta, Richard Hooley, Naci Mocan, Steve Beckman, Shawn Knabb and the participants of the 2004 AEA/ACEAS session and a seminar at the University of Colorado at Denver were very helpful. We are also indebted to Professor Robert McNown and Mr. Kyoo-Hong Cho for their valuable suggestions on econometric analysis. As usual, all errors of omission and commission are the authors'.

References

Baltagi, B. H. (2001). *Econometric analysis of panel data* (2nd ed.). NY: John Wiley and Sons.

Business Week (2004). Worrying about China. January 19. 28-31.

Cabinet Policy Consolidation Bureau (CPCB, Naikakufu Seisaku Tokatsu kan) (2002). The main courses of china's high growth and future perspective. in *The trend of the world economy* (Sekai Keizai no Choryu). Tokyo: Ministry of Finance Press, Fall 2002.

Calvo, G. (1998). Capital flows and capital-market crises: The simple economics of sudden stops." *Journal of Applied Economics*, *1*(1). 35-54.

Chan, J. (2004). Analysts warn china on verge of economic crisis. World Socialist Web Site, *www.wsws.org/articles/2004/feb2004/chin-f18_prn.shtml*.

Chang, G. G. (2001). *The coming collapse of China*. NY: Random House.

Chang, L., & Wonnacott, P. (2003). Adapting to Chinese customs, cultural changes, companies from U.S., Europe find profit. *Wall Street Journal*.

Christopoulos, D. K., & Tsionas, E. G. (2003). A reassessment of balance of payments constrained growth: Results from panel unit root and panel cointegration tests. *International Economic Journal*, *17*(3). 39-54.

Chung, C. (1997). Division of labor across the Taiwan Strait: Macro overview and analysis of the electronic industry. Chapter 6 in Naughton, ed. (1997).

Formey, M. (2003). Workers' wasteland, Cover Story. *Time Asia*, website http://www.time.com/time/asia/covers/1101020617/cover.html.

Gabisch, G., & Lorenz, H. W. (1989) *Business cycle theory, A survey of methods and concepts*. Berlin: Springer-Verlag.

Gao, T. (2003). Ethnic Chinese networks and international investment: Evidence from inward FDI in China. *Journal of Asian Economics*, *14*. 611-629.

Gugler, K., Mueller, D. C., & Yurtoglu, B. B. (2003). Corporate governance and the returns on investment. European Corporate Governance Institute, University of Vienna. Finance WP No. 06/2003

Davidson, R., & MacKinnon, J. G. (2004). *Econometrics theory and methods*. NY: Oxford University Press.

Helpman, E., & Krugman, P. (1985). *Market structure and foreign trade*. Cambridge: MIT Press.

Horstmann, I. J., & Markusen, J. R. (1992). Endogenous market structures in international trade, *Journal of International Economics*. *32*, 109-129.

Hsiao, F. S.T., & Hsiao, M. C. W. (2003).'Miracle growth' in the twentieth century-International comparisons of East Asian development. *World Development*, *31*(2). 227-257.

Hsiao, F. S.T., & Hsiao, M. C. W. (2002). Taiwan in the global economy – Past, present, and future, in *Taiwan in the Global Economy, From an Agrarian Economy to an Exporter of High-Tech Products.* ed. Peter C.Y. Chow. Westport: Praeger. 161-222.

Hsiao, F. S.T., & Hsiao, M. C. W. (2001). Capital flows and exchange rates: Recent Korean and Taiwanese experiences and challenges. *Journal of Asian Economics*, *12*(3). Fall. 353-381.

Hsiao, F. S.T., & Hsiao, M. C. W. (1996). Taiwanese economic development and foreign trade, in *Harvard Studies on Taiwan: Papers of the Taiwan Studies Workshop*. *1*. The John K. Fairbank Center for East Asian Research, Harvard University, 199-270. Also in *Comparative Asian Economies*, J. Y. T. Kuark (Ed), *Contemporary Studies in Economic and Financial Analysis*. *77* (Part B). An International Series of Monographs. Greenwich, CT: JAI Press, 1996. 211-302.

Hsiao, F. S.T., & Hsiao, M. C. W. (1989). *Japanese experience of industrialization and economic performance of Korea and Taiwan-Tests of similarity*. in S. C. Hu & C.F. Lee (Eds), Advances in Financial Planning and Forecasting, Supplement 1, Taiwan's Foreign Investment, Exports, and Financial Analysis. JAI Press. 157-190.

Hsiao, T. T. (1998). A study of comparison, division of labor, and interaction of the automobile industry on both sides of the Straits (in Chinese). the *Quarterly Journal of the Bank of Taiwan*. *49*(3). 89-123.

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, *115*, 53–74.

International Centre for the Study of East Asian Development (ICSEAD) (2003). *East Asian economic perspectives*. Special issue, February.

International Monetary Fund (IMF) (2003). *International financial statistics* (IFS). CD-ROM. January.

International Monetary Fund (IMF) (2002). Foreign direct investment in China: What do we need to know? Transcript of an Economic Forum, May 2.

Janeba, E. (2002). Attracting FDI in a politically risky world. *International Economic Review*, *43*(4). 1127-1155.

Kerr, I. A., & Peter, V. M. (2001). The determinants of foreign direct investment in China. Paper presented at the 30th Annual Conference of Economists, University of Western Australia. September.

La Croix, J. S., Plummer, M., & Lee, K. (Eds). (1995). *Emerging patterns of East Asian investment in China, from Korea, Taiwan, and Hong Kong*. NY: M.E. Sharp.

Lague, D. (2002). On the road to ruin. *Far Eastern Economic review*, November *14*. 32-35.

Lee, D. (2003). Trade balance effects of Korea's foreign direct investment into China. Paper presented at the *Korea and the World Economy, II*. University of Washington, Seattle, August 1-2.

Lee, G. L. (1998). Overseas Chinese investment in the Chinese market-ASEAN capital in new frontier (in Japanese). Chapter 3 in Twu (1998). 83-111.

Lee, J. S. (Ed.) (1996). *The emergence of the South China growth triangle.* Taiwan: Chung-Hua Institution for Economic Research.

Levin, A., Lin, C. F., & Chu, C. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics*, *108*, 1–24.

Lipsey, R. E. (2000). Inward FDI and economic growth in developing countries. *Transnational Corporations*, *9*(1). 67-95.

Maddala, G. S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics*, *61*, 631–52.

Markusen, J. R, Venables, A. J. Konan, D.E. and Zhang, K. (1996). A unified treatment of horizontal direct investment, vertical investment, and the pattern of trade in goods and services. NBER Working Paper, No. 5696.

Naughton, B. (Ed.) (1997). *The China circle*, e*conomics and electronics in the PRC, Taiwan, and Hong Kong*. Washington, D.C: Brookings Institution Press.

Pei, M. (2002). China's governance crisis. *Foreign Affairs*, September/October.

Raff, H., & Srinivasan, K. (1997). Tax incentives for import-substituting foreign investment: Does signaling play a role? *Journal of Public Economics*, *67*, 167-193.

Rauch, J., & Trindade, V. (2002). Ethnic Chinese networks and international trade. *Review of Economics and Statistics*, *84*, 116-130.

Seki, M. (2003). A Shenzhen incubator for small Japanese firms. *FocusJapan* (JETRO). *30*(3). April. 10-11.

Studwell, J. (2002). *The China dream: The quest for the last great untapped market on earth*. Grove/Atlantic Monthly.

Twu, J. Y. (Ed.) (1998). *Chinese economic circle and Japan*, *The basis of new Asian order* (in Japanese). Research Center of International Economic Dynamics, Nagoya, Japan: Nagoya University.

Uehara, K. (1987). *Economic reform and openness policy in China*: *Socialism under open system* (in Japanese). Tokyo: Aoki Shoten.

United Nations Conference on Trade and Development (UNCTAD) (2001). *World investment report 2001*, *Promoting linkages*. New York and Geneva: United Nations.

----- (2003) *World investment report 2003*, *FDI policies for development: National and international perspectives*. New York and Geneva: United Nations.

Wheeler, D., & Mody, A. (1992). International investment location decision: The Case of U.S. firms. *Journal of International Economics*, *33*, 57-76.

Wei, S. J. (1998). China's absorption of foreign direct investment. Chapter 10 in Hiro Lee and David W. Roland-Holst (Eds.), *Economic development and cooperation in the Pacific basin: Trade, investment, and environmental issues*. Cambridge, UK: Cambridge University Press.

Wei, S. S., & Zhu, L. (1995). The growth of foreign and Taiwan investment in the Xiamen Special Economic Zone. in Chapter 7 of La Croix, etc. (1995).

Wei, Y., & Liu, X. (2001). *Foreign direct investment in China-Determinants and impact*. UK: Edward Elgar Publishing Limited.

Wolf, C. Jr., Yeh, K.C., Zycher, B., Eberstadt, N., & Lee, S. H. (2003). *Fault lines in China's economic terrain*. CA: RAND.

World Bank (2003). *World development indicators* (WDI). CD-ROM.

World Economic Forum (WEF) (2003). *The Global competitiveness report*. Cambridge, MA.

Zhang, K. H. (2000). Why is U.S. direct investment in China so small? *Contemporary Economic Policy*, *18*(1). 82-94.

Footnotes

[1] In this paper, China means the China Proper, or the Chinese mainland, separate from Hong Kong and Macao.

[2] The data are taken from the data annexes of UNCTAD, 2003. Note that, the FDI inflow amounts of developed economies and developing economies somehow do not sum to the world total, apparently FDI from free ports (see Table 4) are not included.

[3] The coefficient of variation here is defined as the ratio of unbiased (or sample) standard deviation divided by the mean and then multiplied by 100.

[4] UNCTAD (2001, 25). In the 2001 survey of over 3,000 foreign transnational corporations (TNC) in Hong Kong, 45% planned to increase investment in China, 93% considered the investment climate in China to be favorable or very favorable in the next five years (ibid).

[5] Michel Plummer commented on the original paper that "Firms don't immediately expect a return from their investments, gives one explanation of China's low return. They often take quite a while before they generate income that would show up in the BOP. Given that DFI inflows in China are relatively NEW, perhaps this could explain why rates of return are low … the return on the huge increase in the denominator will only show up in the numerator after a while." However, if Table 3 is any indication, China's rates of return on investment are still very low even if we consider the period from 1994 to 1999.

[6] The $q_m = r/i$ where r is the return on a firm's investment, and i is its cost of capital, and is the marginal Tobin's q. It is "the change in the market value of a firm divided by the change in its capital stock (investment) that caused it" (Gugler, et at., 2003, 9), and is an ordinary least-squares estimate for each country. Note that, conceivably, the rates of return on FDI investment should be higher than the general corporate investment in order to attract FDI.

[7] According to the Corruption Perception Index (CPI) of Transparency International, in 2003, China ranked 66th out of 133 countries, and 2002 score of the bribe payers index was 20th out of 21 countries. Its CPI average from 1995 to 2001 was 3.0, lower than Japan (6.5), Korea (4.3), Taiwan (5.3), Singapore (9.0), Malaysia (5.1), Thailand (3.1), the same as that of Philippines, but higher than that of Indonesia (2.1). The general theory is that corruption is detrimental to FDI inflows.

[8] China consistently ranked slightly below the 50 percentile among the countries surveyed in WEF. In 1999, it ranked 32nd out of 59 countries, far below Singapore (1st), HK (2nd), Taiwan (4th), Korea (22nd), but one rank above Philippines (33rd), Indonesia (37th), and India (52nd). Its growth projections for 2000-2008 in 1999 ranked 17th out of 59 countries, below Singapore (1st), Taiwan (2nd), HK (4th), Indonesia (11th), Philippines (14th), but above Korea (21st), and Thailand (23rd). Also see Hsiao and Hsiao (2002, 200-203)

[9] The Chinese data show the approved and actual amounts of FDI. The approved amount is, on average, twice larger than the actual amount. There is no distinction between approved and actual cases. No explanations are given. From the context of the data compilation, we consider the cases to be actual cases. For earlier FDI data in Table 4, see La Croix, etc. (1995, 16).

[10] They are, in the order of up-to-1999 cumulative amount of FDI, Italy, Sweden, Belgium, Denmark, Austria, Spain, Finland, Luxembourg, Ireland, Portugal, and Greece. Except Italy (a total of $0.5 billion) and Sweden ($0.2 billion), all others had mere 0.1 billion or smaller investment, although their size is larger than Taiwan's $0.5 million, except Greece ($0.1 million). They are not listed in Table 4.

[11] If the cases in Table 4 are on the approval basis, and if the approval cases are, like the amount, twice larger than the actual cases, then the actual size will be about US$ 1.8 million, still a very small amount.

[12] Mote that the average is misleading. The outliers are Coca-Cola which invested $1.1 billion, Kodak, $1.2 billion, Motorola, $3.4 billion, Proctor and Gamble, $1 billion, Siemens, $610 million, Yum Brands (KFC and Pizza Hut) over $400 million. They are reported to be profitable (Chang and Wonnacott, 2003).

[13] Part of the Hong Kong investment is actually either Taiwanese investment or Chinese capital from China in disguise, or round-tripping (UNCTAD, 2001, 25).
[14] For a detailed account of investment by oversea Chinese in ASEAN to China, see Lee (1998), and other articles in Twu (1998).
[15] More than half of Hong Kong's FDI outflows are routed to these free ports, some of the funds are channeled to China, and a sizeable portion even goes back to HK, or through HK to China. "Perhaps as much as 40 per cent of total FDI inflows to Hong Kong … in 1998 was 'Hong Kong-tax haven routing.' Indeed, British Virgin Islands became the fourth largest source of FDI in China during 1999-2000, whereas Hong Kong's outward FDI directly to the mainland decreased since 1998." (UNCTAD, 2001, 25).
[16] At this point a satirist might ask "those Chinese Marxists/Communists please stand up!"
[17] "With the help of capital from Taiwan, the industrial belt stretching from Shenzhen to Dongguan has emerged as the world's largest supplier of information equipment. More than half of the roughly 13,000 foreign companies in Dongguan were … from Hong Kong, but Taiwan … has … 4,000 firms (… Japanese companies 300). Of world production … southeast China commands shares of 90% for mice, 60% for keyboards, and 50% for personal computers. … 50% for copiers and printers. … some 80% to 90% of the parts for such devices can be procured in an area within one-hour distance. The Zhujiang Delta has turned into a veritable battlefield … It is said that for every firm that successfully moves into China, there is another firm that fails." (Seki, 2003).
[18] For the details of FDI from Hong Kong, Taiwan, and Korea in China, see various chapters in La Croix, Plummer, and Lee (1995), Lee (1996).
[19] The primitive and imperfect legal regime in China made Western MNC wary about security and stability, but benefit overseas Chinese (especially those from Hong Kong) because of cultural and linguistic links (Wei, 1998, 336), perhaps through Guanxi and corruption.
[20] Apparently, Taiwan's relation to China is similar to Sri Lanka's to India, and Hong Kong's relation to China is similar to that of foreign territories along the coast of India, such as Goa (Portugal), Mahe (France), Karikal (France), Pondichery (France), etc., to India. However, India is short of countries like Japan and the United States to "exploit" these territories to develop, and in turn, to "exploit" India. Here is the uniqueness of China, while the Indians may be aghast to such a notion.
[21] Our emphasis on cultural similarity and geographical proximity is not new. In Hsiao and Hsiao (1996, 272), we have pointed out that "So far as Japanese investment (in Taiwan) is concerned, geographic proximity, historic ties, and socio-linguistic similarity might have played a more important role than the political stability." Similar statements can be applied to the case in South Korea. Most Taiwanese and Koreans spoke Japanese after WWII (Hsiao and Hsiao, 2003). The Chinese case today is merely a repetition of history, with stronger ties on ethnicity and cultural similarity.
[22] "In the 1980s and the early 1990s, … Chinese government … systematically suppressed local entrepreneurs" for the sake of FDI, local "silk manufacturing, ivory sculptures, herbal medicine, … are populated by foreign firms." (IMF, 2002).
[23] To attract Taiwanese investment in the Xiamen Special Economic Zone, "The first goal was to promote *détente* between the two sides of the straits and to increase unification prospects. … The "hot tide" of Taiwan investment … obliged the Taiwan authorities to retreat, … induced large changes in Taiwan's policies vis-à-vis the mainland." (Wei and Zhu, 1995, 119).
[24] Almost 500 Chinese missiles are aiming at Taiwan along the Eastern coast of China. The Taiwan Strait is one of the most insecure areas in the world.
[25] Note also that the scale of Taiwanese FDI in China is also "substantially smaller than Taiwanese FDI in other low wage countries," such as Malaysia and Thailand (Chung, 1997, 168).
[26] In Xiamen in the early 1990s, Taiwanese "Small-to-medium-size projects (less than US$ 1 million) accounted for about 65 percent of all projects. … and returned profits almost immediately. … projects are labor intensive. Nevertheless, .. technology and management were more advanced than Chinese firms,

most of the Taiwan firms' products were exported overseas. … Europe and American (75 percent), Japan (10 percent),…". (Wei and Zhu, 1995. 117-118). Chung (1997, 187-188) noted that, as Taiwanese exporters face harsh international competition, even savings of 8% (3% on direct labor and 5% on indirect cost) by producing in China, as compared with 5% in ASEAN, are "enough to attract FDI into China at the expense of the ASEAN countries."

[27] Taiwan's FDI data are available only from 1989 to 2002, and Korea's data from 1990 to 2002.

[28] In the dynamic model, the lagged variable FDIP starts from 1987. To make static and dynamic models to have the same periods of time series, all the time series lost one year in the static model.

[29] Furthermore, since the number of cross-section units (N = 5) is smaller than the number of years (t = 12 or more), the random effects model cannot be used.

[30] In the earlier version of this paper, in which we used nominal variables of GDPX, YDIFF, OPEN, and EXRATE, where YDIF is the difference of per capita GDP between the home country and China as a proxy for wage differential, we estimated the cross-section specific intercepts and slope coefficients for each country and found that, as the conventional theory predicts, the wage differential was significant for Hong Kong and Taiwan, but not for Korea, Japan and the United States, and the market size is significant for Korea, Japan and the United States, but not for Hong Kong and Taiwan.

[31] In the ARDL models, the coefficients of FDIP, GDPX, and OPEN are always positive and significant at the 10% level. The coefficient of WRATIO is always insignificant. The coefficient of EXRATE is positive and significant for the models with the lag length at one and two, and it is positive but insignificant for the model with the lag length at three.

[32] In an earlier study from 1979 to 1997, Zhang (2000) explained that US FDI is small mainly due to small domestic market size, troubled Sino-US relation, and political instability in China.

Figure 1. Foreign Direct Investment in China
Cases

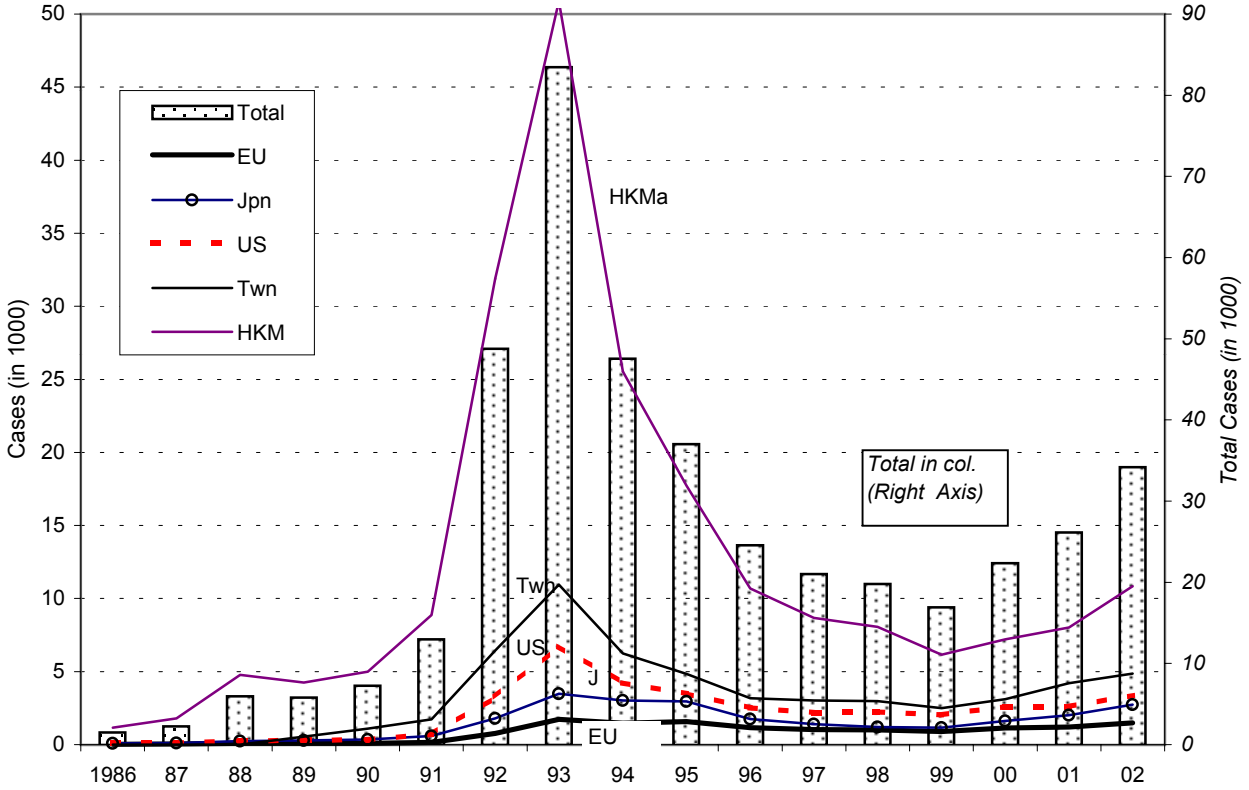

Figure 2. Actural Foreign Direct Investment
Total Amount and Amount per Case

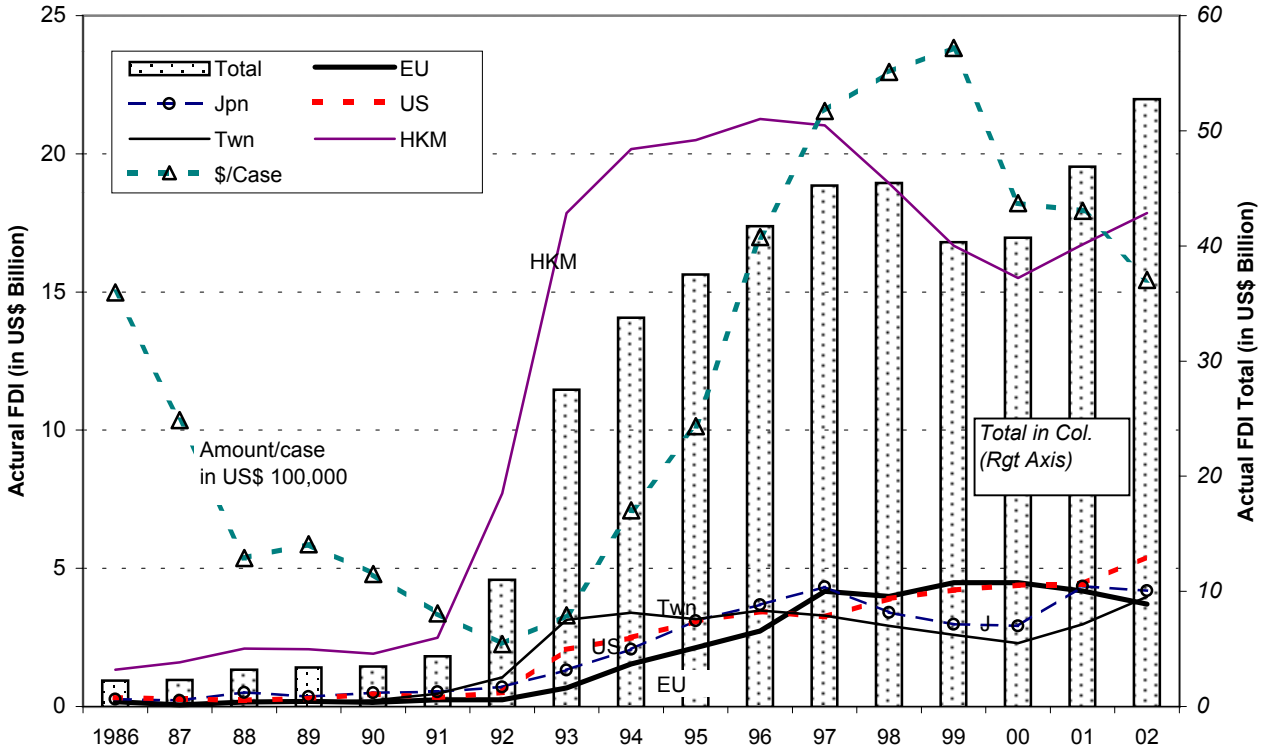

Figure 3. Foreign Direct Investment in China
Cases (in % of total each year)

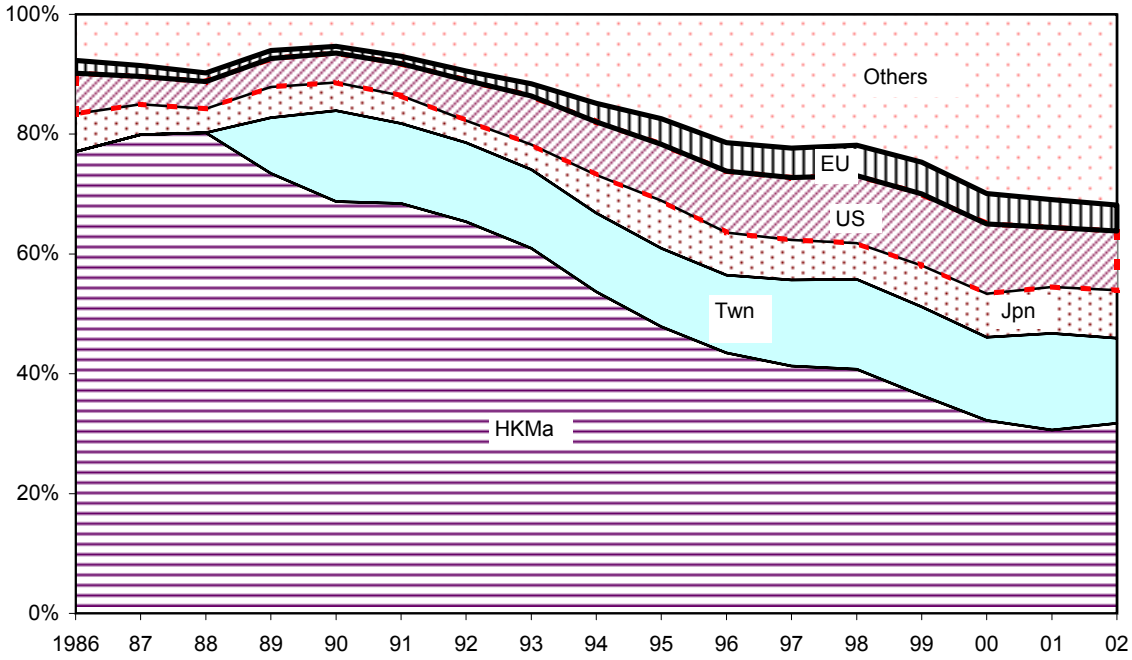

Figure 4. Actual Foreign Direct Investment in China
Amount (in % of total each year)

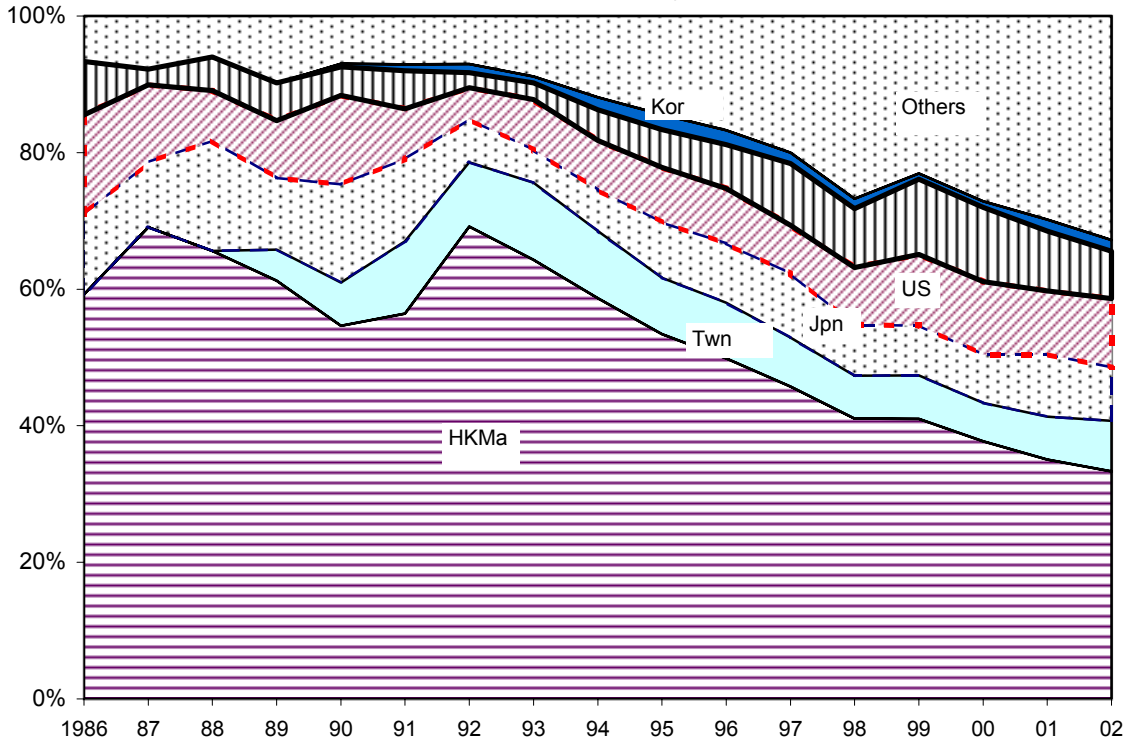

Table 1. FDI inflows, by host region and country, 1991-2002 (% and US$ billion)

	Avg/yr 1991-96	1997	1998	1999	2000	2001	2002	Avg/yr 1997-02
World	**254.3**	**481.9**	**686.0**	**1079.1**	**1393.0**	**823.8**	**651.2**	**852.5**
Growth rate(%)		89	42	57	29	(41)	(21)	235
World share(%)	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
CV(%)								39
Developed economies	**154.6**	**269.7**	**472.3**	**824.6**	**1120.5**	**589.4**	**460.3**	**622.8**
Growth rate(%)		74	75	75	36	(47)	(22)	303
World share(%)	*60.8*	*56.0*	*68.8*	*76.4*	*80.4*	*71.5*	*70.7*	*73.1*
CV(%)								49
European Union	**87.6**	**127.9**	**249.9**	**475.5**	**683.9**	**389.4**	**374.4**	**383.5**
Growth rate(%)		46	95	90	44	(43)	(4)	338
World share(%)	*34.4*	*26.5*	*36.4*	*44.1*	*49.1*	*47.3*	*57.5*	*45.0*
CV(%)								50
United States	**46.8**	**103.4**	**174.4**	**283.4**	**314.0**	**144.0**	**30.0**	**174.9**
Growth rate(%)		121	69	62	11	(54)	(79)	273
World share(%)	*18.4*	*21.5*	*25.4*	*26.3*	*22.5*	*17.5*	*4.6*	*20.5*
CV(%)								62
Japan	**0.9**	**3.2**	**3.2**	**12.7**	**8.3**	**6.2**	**9.3**	**7.2**
Growth rate(%)		262	(1)	299	(35)	(25)	49	706
World share(%)	*0.3*	*0.7*	*0.5*	*1.2*	*0.6*	*0.8*	*1.4*	*0.8*
CV(%)								52
Developing economies	**91.5**	**193.2**	**191.3**	**229.3**	**246.1**	**209.4**	**162.1**	**205.2**
Growth rate(%)		111	(1)	20	7	(15)	(23)	124
World share(%)	*36.0*	*40.1*	*27.9*	*21.2*	*17.7*	*25.4*	*24.9*	*24.1*
CV(%)								15
Africa	**4.6**	**10.7**	**8.9**	**12.2**	**8.5**	**18.8**	**11.0**	**11.7**
Growth rate(%)		132	(16)	37	(31)	121	(41)	154
World share(%)	*1.8*	*2.2*	*1.3*	*1.1*	*0.6*	*2.3*	*1.7*	*1.4*
CV(%)								32
South America	**15.0**	**48.2**	**52.4**	**70.3**	**57.2**	**39.7**	**25.8**	**49.0**
Growth rate(%)		222	9	34	(19)	(31)	(35)	227
World share(%)	*5.9*	*10.0*	*7.6*	*6.5*	*4.1*	*4.8*	*4.0*	*5.7*
CV(%)								31
Asia	**59.4**	**109.1**	**100.0**	**108.5**	**142.1**	**106.8**	**95.0**	**110.2**
Growth rate(%)		84	(8)	9	31	(25)	(11)	86
World share(%)	*23.4*	*22.6*	*14.6*	*10.1*	*10.2*	*13.0*	*14.6*	*12.9*
CV(%)								15

Table 1 (Cont'd). FDI in flows, by host region and country, 1991-2002

	Avg/yr 1991-96	1997	1998	1999	2000	2001	2002	Avg/yr 1997-02
South, East & SE Asia	**56.1**	**100.1**	**90.1**	**105.3**	**138.7**	**97.6**	**88.6**	**103.4**
Growth rate(%)		78	(10)	17	32	(30)	(9)	84
World share(%)	*22.1*	*20.8*	*13.1*	*9.8*	*10.0*	*11.8*	*13.6*	*12.1*
CV(%)								18
1 Korea	**1.2**	**2.8**	**5.4**	**9.3**	**9.3**	**3.5**	**2.0**	**5.4**
Growth rate(%)		130	90	72	(1)	(62)	(44)	337
World share(%)	*0.5*	*0.6*	*0.8*	*0.9*	*0.7*	*0.4*	*0.3*	*0.6*
CV(%)								60
2 Taiwan	**1.3**	**2.2**	**0.2**	**2.9**	**4.9**	**4.1**	**1.4**	**2.6**
Growth rate(%)		71	(90)	1,218	68	(17)	(65)	102
World share(%)	*0.5*	*0.5*	*0.0*	*0.3*	*0.4*	*0.5*	*0.2*	*0.3*
CV(%)								65
3 Singapore	**6.9**	**13.5**	**7.6**	**13.2**	**12.5**	**10.9**	**7.7**	**10.9**
Growth rate(%)		97	(44)	74	(6)	(12)	(30)	59
World share(%)	*2.7*	*2.8*	*1.1*	*1.2*	*0.9*	*1.3*	*1.2*	*1.3*
CV(%)								25
4 Hong Kong	**6.1**	**11.4**	**14.8**	**24.6**	**61.9**	**23.8**	**13.7**	**25.0**
Growth rate(%)		88	30	66	152	(62)	(42)	313
World share(%)	*2.4*	*2.4*	*2.2*	*2.3*	*4.4*	*2.9*	*2.1*	*2.9*
CV(%)								75
NIEs total	**15.5**	**30.0**	**28.0**	**50.1**	**88.6**	**42.4**	**24.8**	**44.0**
Growth rate(%)		94	(7)	79	77	(52)	(41)	184
World share(%)	*6.1*	*6.2*	*4.1*	*4.6*	*6.4*	*5.1*	*3.8*	*5.2*
CV(%)								54
5 Indonesia	**3.0**	**4.7**	**(0.4)**	**(2.7)**	**(4.6)**	**(3.3)**	**(1.5)**	
6 Malaysia	**5.4**	**6.3**	**2.7**	**3.9**	**3.8**	**0.6**	**3**	
7 Philippines	**1.2**	**1.3**	**1.7**	**1.7**	**1.3**	**1.0**	**1.1**	
8 Thailand	**2.0**	**3.9**	**7.5**	**6.1**	**3.4**	**3.8**	**1.1**	
9 VietNam	**1.2**	**2.6**	**1.7**	**1.5**	**1.3**	**1.3**	**1.2**	
ASEAN5 total	**12.8**	**18.7**	**13.3**	**10.5**	**5.2**	**3.4**	**5.1**	**9.3**
Growth rate(%)		38	(34)	(24)	(69)	(44)	41	-27
World share(%)	*5.0*	*3.9*	*1.9*	*1.0*	*0.4*	*0.4*	*0.8*	*1.1*
CV(%)								63
10 China	**25.5**	**44.2**	**43.8**	**40.3**	**40.8**	**46.8**	**52.7**	**44.8**
Growth rate(%)		74	(1)	(8)	1	15	12	76
World share(%)	*10.0*	*9.2*	*6.4*	*3.7*	*2.9*	*5.7*	*8.1*	*5.3*
CV(%)								10
11 India	**1.1**	**3.6**	**2.6**	**2.2**	**2.3**	**3.4**	**3.4**	**2.9**
Growth rate(%)		234	(27)	(18)	7	47	1	170
World share(%)	*0.4*	*0.8*	*0.4*	*0.2*	*0.2*	*0.4*	*0.5*	*0.3*
CV(%)								22

Sources: UNCTAD, 2003, Annex Table B1. Negative numbers are in parentheses.

Table 2. Rates of Return on FDI, selected economies (%)

	1999	rkg	2000	rkg	2001	rkg	1999-2002 *Avg*	rkg
World average	**7.1**		**6.8**		**5.5**		***6.5***	
Developed countries average	7.4		7.1		5.7		*6.7*	
Developing economies average	4.6		4.3		4.2		*4.4*	
Hong Kong	13.6	*1*	12.5	*2*	11.5	*1*	*12.5*	*1*
Malaysia	11.5	*3*	14.1	*1*	11.2	*2*	*12.3*	*2*
Papua New Guinea	13.6	*2*	10.1	*3*	10.1	*3*	*11.3*	*3*
Philippines	3.6	*6*	9.5	*5*	8.8	*5*	*7.3*	*4*
Kazakhstan	3.2	*8*	9.6	*4*	9	*4*	*7.3*	*5*
Azerbaijan	0.1	*10*	9.3	*6*	8.6	*6*	*6.0*	*6*
China	**5.6**	***4***	**6.2**	***7***	**5.8**	***8***	***5.9***	***7***
Indonesia	5.5	*5*	5.7	*9*	5.4	*9*	*5.5*	*8*
Pakistan	3.4	*7*	6.1	*8*	7	*7*	*5.5*	*9*
Korea	3.0	*9*	3.1	*10*	3.3	*10*	*3.1*	*10*
Average returns/10 ctries	6.31		8.62		8.07		7.7	

Source: UNCTAD, 2003, Annex Table A. II. 2. The data are from balance-of-payments statistics.

Table 3. Net Domestic Returns on Investment by Country

Country	q	*rakg/47*	Sample period	Sample size
ADC+				
Hong Kong	0.78	*22*	1985-2000	660
Japan	0.86	*15*	1985-2000	14.874
Taiwan	1.26	*2*	1988-1999	354
Singapore	0.97	*12*	1985-2000	1.182
South Korea	0.70	*24*	1988-2000	199
North America				
USA	1.05	*9*	1985-2000	52.793
Canada	1.16	*6*	1985-2000	9,536
ASEAN4+				
Malaysia	0.86	*15*	1985-2000	1.809
Thailand	0.64	*30*	1986-2000	1328
Indonesia	0.84	*20*	1989-1999	516
Philippines	1.00	*11*	1985-1999	249
China	0.45	*43*	1994-1999	121
Pakistan	0.40	*45*	1993-2000	105
India	0.80	*21*	1988-2000	906
Free Ports				
Bermuda	0.91	*15*	1985-2000	821
Cayman Islands	0.58	*33*	1985-2000	161
EU				
Great Britain	0.85	*19*	1985-2000	9402
Netherlands	0.69	*27*	1985-2000	88
Germany	0.57	*35*	1985-2000	2740
France	0.57	*35*	1985-2000	2.591
Latin America				
Panama	1.25	*3*	1985-2000	36
Chile	1.24	*4*	1988-1999	214
Argentina	0.78	*22*	1989-2000	86
Venezuela	0.58	*33*	1991-2000	32
Mexico	0.50	*41*	1986-1999	312
Colombia	0.43	*44*	1989-1999	44
Brazil	0.25	*46*	1989-2000	379
Peru	0.11	*47*	1992-2000	45

Sourses: Gugler, et al. (2003)

Notes: Returns of investment as a fraction of cost of capital.

Table 4. Cummulative FDI into China, 1979-1999, and 2002 (% and US$)

	1979-1999						2002					
	Case		Amount		Size		Case		Amount		Size	
	%	*Rkg*	%	*Rkg*	**m**	*Rkg*	%	*Rkg*	%	*Rkg*	**m**	*Rkg*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Grand Total	**341.5** *(t)*		**307.6** *(b)*		**0.9**		**34.2** *(t)*		**52.7** *(b)*		**1.5**	
	100		100				100		100			
ADC+	**274.8** *(t)*		**230.8** *(b)*		**0.8**		**23.9** *(t)*		**31.5** *(b)*		**1.3**	
HK	54.1	*1*	50.3	*1*	**0.8**	*18*	31.1	*1*	33.9	*1*	**1.6**	*14*
Macao	1.9	*8*	1.2	*11*	**0.6**	*26*	1.5	*11*	0.9	*16*	**0.9**	*27*
Japan	5.5	*4*	8.1	*3*	**1.3**	*11*	7.9	*5*	7.9	*4*	**1.5**	*17*
Taiwan	12.7	*2*	7.8	*4*	**0.5**	*27*	13.9	*2*	7.5	*5*	**0.8**	*30*
Singapore	2.5	*7*	4.8	*5*	**1.7**	*9*	2.7	*8*	4.4	*8*	**2.5**	*10*
Korea	3.7	*6*	2.9	*8*	**0.7**	*23*	11.5	*3*	5.2	*6*	**0.7**	*31*
Total %	80.5		75.0				68.6		59.8			
North America	**33.1** *(t)*		**27.7** *(b)*		**0.8**		**4.1** *(t)*		**6.0** *(b)*		**1.5**	
USA	8.4	*3*	8.3	*2*	**0.9**	*17*	9.7	*4*	10.3	*3*	**1.6**	*15*
Canada	1.3	*9*	0.7	*14*	**0.5**	*29*	2.0	*9*	1.1	*13*	**0.8**	*29*
Total %	9.7	*12*	9.0	*16*			11.7		11.4			
ASEAN4	**6.6** *(t)*		**5.4** *(b)*		**0.8**		**0.7** *(t)*		**0.9** *(b)*		**1.2**	
Malysia	0.6	*14*	0.7	*15*	**1.0**	*15*	0.9	*14*	0.7	*17*	**1.2**	*24*
Thailand	0.8	*10*	0.6	*16*	**0.7**	*24*	0.5	*18*	0.4	*18*	**1.2**	*23*
Phillipines	0.4	*17*	0.3	*19*	**0.7**	*21*	0.4	*19*	0.4	*19*	**1.2**	*21*
Indonesia	0.2	*19*	0.2	*20*	**1.0**	*16*	0.3	*22*	0.2	*22*	**1.3**	*19*
Total %	1.9		1.8				2.1		1.6			
EU	**10.3** *(t)*		**21.6** *(b)*		**2.1**		**1.5** *(t)*		**3.7** *(b)*		**2.5**	
UK	0.8	*11*	2.5	*9*	**3.0**	*5*	1.0	*13*	1.7	*11*	**2.7**	*7*
Germany	0.6	*12*	1.6	*10*	**2.3**	*7*	1.0	*12*	1.8	*10*	**2.6**	*8*
France	0.5	*15*	1.2	*12*	**2.3**	*6*	0.5	*17*	1.1	*14*	**3.6**	*4*
Netherlands	0.2	*18*	0.7	*13*	**3.0**	*4*	0.4	*20*	1.1	*15*	**4.5**	*2*
Other EU	1.0		1.1		**1.0**		1.5		1.4		**1.5**	
Total %	3.0		7.0				4.3		7.0			
Free Ports	**2.4** *(t)*		**11.0**		**4.6**		**2.7** *(t)*		**8.2** *(b)*		**3.0**	
Virgin islands	0.6	*13*	3.1	*7*	**4.6**	*2*	5.6	*7*	11.6	*2*	**3.1**	*6*
Cayman islands	0.0	*26*	0.3	*18*	**6.3**	*1*	0.6	*16*	2.2	*9*	**5.9**	*1*
Western Samoa	0.1	*24*	0.2	*21*	**3.5**	*3*	1.5	*10*	1.7	*12*	**1.7**	*13*
Total %	0.7		3.6				7.7		15.5			
Others	**14.5** *(t)*		**11.1** *(b)*		**0.8**		**2.0** *(t)*		**2.4** *(b)*		**1.2**	
Total %	4.2	*5*	3.6	*6*			5.6	*6*	4.6	*7*		*20*

Source: National Committee of Foreign Economy and Trade; China Statistical Yearbook, various years; Their websites. Levels are in bold face. (t), in thousand; (b), in US$ billion; (m) in US$ million.

Table 5. FDI by Region in China, 1979-1999, and 2002

		Cases						Amount						Size			
		Up to 1999			2002			Up to 1999			2002			Up to 99		2002	
	Unit	t	%	rkg	t	%	rkg	b	%	rkg	b	%	rkg	m		m	rkg
	Total	**342**	100		**34**	100		**308**	100		**53**	100		**0.9**		**1.5**	
	Eastern region																
1	Guangdong	**80**	23	*1*	**6**	17	*2*	**87**	28	*1*	**11**	21	*1*	**1.1**	*5*	**2.0**	*7*
2	Jiangsu	**38**	11	*2*	**6**	17	*1*	**37**	12	*2*	**10**	19	*2*	**1.0**	*6*	**1.8**	*13*
3	Fujian	**26**	8	*4*	**2**	5	*9*	**30**	10	*3*	**4**	7	*5*	**1.1**	*4*	**2.1**	*6*
4	Shanghai M	**20**	6	*5*	**3**	9	*5*	**25**	8	*4*	**4**	8	*4*	**1.2**	*3*	**1.4**	*19*
	Subtotal	**164**	48		**16**	48		**179**	58		**30**	56		**1.1**	a	**1.8**	a
5	Shandong	**26**	8	*3*	**4**	12	*3*	**18**	6	*5*	**5**	9	*3*	**0.7**	*18*	**1.2**	*26*
6	Liaoning	**19**	6	*6*	**2**	6	*6*	**13**	4	*7*	**3**	6	*6*	**0.7**	*21*	**1.6**	*16*
7	Beijing M	**15**	4	*9*	**1**	4	*10*	**13**	4	*8*	**2**	3	*10*	**0.9**	*11*	**1.3**	*23*
8	Tianjin M	**13**	4	*10*	**1**	2	*12*	**12**	4	*9*	**2**	3	*12*	**0.9**	*8*	**1.9**	*9*
9	Zhejiang	**17**	5	*7*	**3**	10	*4*	**10**	3	*11*	**3**	6	*7*	**0.6**	*25*	**0.9**	*29*
10	Central Adm**	**2**	0	*30*	**0**	0	*34*	**8**	3	*12*	**0.3**	1	*25*	**5.1**	*1*	**67.9**	*1*
11	Hebei	**9**	3	*11*	**0**	1	*16*	**6**	2	*15*	**1**	1	*17*	**0.7**	*19*	**1.6**	*14*
12	Hainan	**9**	3	*12*	**0**	1	*23*	**6**	2	*16*	**1**	1	*19*	**0.7**	*20*	**2.2**	*5*
	Subtotal	**110**	32		**13**	37		**85**	28		**16**	31		**0.8**	a	**1.3**	a
	City (in province)																
	Shenzhen (Guangdong)	***16***	*5*	*8*	***2***	*6*	*7*	***14***	*4*	*6*	***3***	*5*	*8*	***0.8***	*13*	***1.4***	*21*
	Xiamen (Fujian)	***5***	*1*	*24*	***0***	*1*	*18*	***10***	*3*	*10*	***1***	*1*	*18*	***2.2***	*2*	***1.6***	*15*
	Qingdao (Shandong)	***6***	*2*	*16*	***2***	*5*	*8*	***5***	*2*	*18*	***2***	*4*	*9*	***0.8***	*14*	***1.2***	*24*
	Dalian (Liaoning)	***8***	*2*	*13*	***1***	*2*	*13*	***7***	*2*	*13*	***2***	*3*	*11*	***0.9***	*10*	***1.9***	*8*
	Ninpo (Zhejiang)	***5***	*1*	*23*	***1***	*3*	*11*	***3***	*1*	*21*	***1***	*2*	*15*	***0.7***	*15*	***1.0***	*28*
	Eastern total*	**274**	80		**29**	85		**265**	86		**46**	87		**1.0**		**1.6**	
	Central total	**42**	12		**3**	8		**26**	9		**5**	10		**0.6**		**1.8**	
	Western total	**23**	7		**1**	3		**15**	5		**1**	2		**0.6**		**1.3**	
	Grand Total#	**342**	99		**33**	96		**306**	100		**52**	98		**0.9**		**1.6**	

Sources: Same as Table 4.

* The provinces and municipality total. The cities in italics are included in the provinces.

** Central Administrative Departments. The 2002 data do not list this item, but list only "Others." The 2002 list does not include Sichuan, Zhongqin and Guizhou. The "Others" in 2002 consists only of 4 cases with the amount of 271.6 million, resulting in the size of $67.9 million.

The columns do not add to 100% due to rounding. Ranking (rkg) is taken for all 20 provinces, five autonomous regions, three municipalities, the five cities shown in the table, and "others."

a = average; b = US$ billion; m = US$ million; t = thousand.

Table 6. Approved FDI by Industry, 1979-2002, 2002

Item	Approved 1979-2002					Appr'd 02		Actual 02				
	Cases		Amount		Size	Amount		Cases		Amount		Size
Unit	1000	%	US$ b	%	US$ m	US$ b	%	1000	%	US$ b	%	US$ m
Total	**424**	*100*	**828**	*100*	**2.0**	**83**	*100*	**34**	*100*	**53**	*100*	**1.5**
Primary industry	**12**	*3*	**16**	*2*	**1.3**	**2**	*2*	**1**	*3*	**1**	*2*	**1.1**
Secondary Industry	**325**	*77*	**566**	*68*	**1.7**	**61**	*74*	**25**	*74*	**39**	*73*	**1.5**
Manufacturing	**310**	*73*	**524**	*63*	**1.7**							
Construction	**10**	*2*	**23**	*3*	**2.3**							
Transp and commun.	**5**	*1*	**19**	*2*	**4.0**							
Tertiary Industry	**87**	*21*	**247**	*30*	**2.8**	**20**	*24*	**8**	*23*	**13**	*25*	**1.6**
Trading and restaurants	**21**	*5*	**26**	*3*	**1.2**							
Real estate and pub services	**45**	*11*	**181**	*22*	**4.0**							
Health, sports, & soc welf	**1**	*0*	**5**	*1*	**4.6**							
Edu, culture, and arts	**1**	*0*	**2**	*0*	**1.6**							
Science and technology	**3**	*1*	**3**	*0*	**1.1**							
Others	**15**	*4*	**28**	*3*	**1.9**							

Sources: Same as Table 4. b = billion, m = million.

Table 7. FDI Firms Which Had US$ 10 Million or More Exports in 1999

Unit: US$ million or billion

	Exports US$ m	No. of Firms	% change over 1998	Exports US$ b	% change over 1998	Size US$ m 1998	Size US$ m 1999	% of total FDI exports	% of total exports
1	10-30	**1049**	11	**17.1**	11	**16**	**16**	19	9
2	30-50	**175**	11	**6.6**	12	**38**	**38**	7	3
3	50-100	**134**	12	**9.2**	8	**71**	**68**	10	5
4	above 100	**83**	38	**17.6**	37	**214**	**212**	20	9
	Sum	**1441**	13	**50.5**	15	**33**	**35**	57	26

Sources: Same as Table 4. b = billion, m = million.

Table 8. FDI Motives of Firms, Survey results (%)

	Country	Taiwan(d)	Japan(b)	Japan(c)	Korea (a)
	Year	1998	2001	1986	2002
	Sample size	22		131	
1	New market opportunity	64	55	82	36
2	Lower production cost	86	78	23	43
3	Easier access to resources	64	21	18	6
4	Follow own and other industries	73	20	36	
5	To increase exports				5
6	Technology transfer				1
7	Countering trade block				3
8	FDI policy	14			4
9	Others				3
					100.0

Sources (a).Lee (2003); (b). CPCB (2002) JETRO survey; (c). Uehara (1987); (d). Hsiao(1998). Automobile parts industry survey in Taiwan. Sample size22. In (b), (c), (d), multiple answers were allowed.

Table 9. Problems faced by FDI firms in China (%)

	Country	Taiwan	Japan
	Year	1998	1986
	Sample size	22	141
1	Confusing legal system	68	53
2	Exchange rate/finance	50	47
3	Exports requirements		32
4	Lack of infrastructure	32	31
5	Corruption	45	
6	Adminstrative inefficiency	64	14
7	Quality of workers		12

Sources: Same as Table 8.

Table 10. Panel unit root tests of the Variables

Variables	Levels			First difference		
	LLC	IPS	ADF-Fisher	LLC	IPS	ADF-Fisher
FDI	-2.933 (0.002)***	-1.472 (0.071)*	16.728 (0.081)*	-5.461 (0.000)***	-4.112 (0.000)***	35.313 (0.000)***
FDIP	-2.052 (0.020)**	-1.748 (0.040)**	19.627 (0.033)**	-1.746 (0.040)**	-2.550 (0.005)***	24.171 (0.007)***
GDPX	3.585 (0.999)	3.529 (0.999)	2.184 (0.995)	-4.478 (0.000)***	-3.955 (0.000)***	35.899 (0.000)***
WRATIO	0.323 (0.627)	0.951 (0.829)	4.510 (0.921)	-5.657 (0.000)***	-2.991 (0.001)***	25.261 (0.005)***
OPEN	-3.126 (0.001)***	-1.261 (0.104)*	15.174 (0.126)	-7.280 (0.000)***	-3.415 (0.000)***	33.671 (0.000)***
EXRATE	-1.745 (0.041)**	-0.335 (0.369)	9.207 (0.513)	-7.276 (0.000)***	-4.942 (0.000)***	42.996 (0.000)***

Notes:
Test equation includes individual effects, automatic selection of lags based on AIC: 0 to 2, and the p-values are in the parentheses.
*** (**, *) denotes rejection of null hypothesis: unit root at the 1% (5%, 10%) level of significance.

Table 11. Johansen Cointegration tests: GDPX, WRATIO, and EXRATE

Country	Max eigenvalue statistic Null hypothesis: rank = r			k
	r = 0	r <= 1	r <= 2	
Hong Kong	50.664 (0.000)***	23.027 (0.002)***	2.000 (0.157)	2
Taiwan	34.973 (0.000)***	10.037 (0.210)	4.561 (0.033)**	1
Korea	57.850 (0.000)***	8.711 (0.311)	1.135 (0.287)	1
Japan	52.562 (0.000)***	12.367 (0.100)*	5.603 (0.018)**	2
USA	49.917 (0.000)***	24.760 (0.001)***	18.543 (0.000)***	2
Fisher Chi-sq. panel cointeg.	89.906 (0.00000)***	37.253 (0.00005)***	39.505 (0.00002)***	

Notes:
Test equation includes constant and linear deterministic trend, and the p-values are in the parentheses.
*** (**, *) denotes rejection of the null hypothesis at the 1% (5%, 10%) level.

Table 12. Panel Data Regression - the Fixed Effects Model

Dependent variable: FDI				Unbalanced observations: 73			
	Static Model			Dynamic Model			
	Coefficient	t-value	p-value	Coefficient	t-value	p-value	
Intercept							
HKM-C	-14.056	-4.59	0.00 ***	-2.811	-1.09	0.28	
TWN-C	-15.083	-4.07	0.00 ***	-2.223	-0.73	0.47	
KOR-C	-15.392	-3.23	0.00 ***	-0.454	-0.12	0.91	
JPN-C	-19.725	-4.20	0.00 ***	-2.671	-0.68	0.50	
USA-C	-23.123	-6.27	0.00 ***	-6.614	-2.00	0.05	**
Slope							
FDIP				0.585	8.10	0.00	***
GDPX	1.409	6.88	0.00 ***	0.409	2.15	0.04	**
WRATIO	0.779	2.87	0.01 ***	0.063	0.30	0.77	
OPEN	0.750	4.91	0.00 ***	0.308	2.55	0.01	***
EXRATE	0.576	1.40	0.17 *	0.776	2.67	0.01	***
Adjusted R^2	0.886			0.943			
d.w. (d)	1.339						

Note:
*** (**, *) denotes significant at the 1% (5%, 20%) level, respectively.