Chantasasawat, Busakorn; Fung, K. C.; Iizaka, Hitomi; Siu, Alan

**Working Paper**

# Foreign Direct Investment in East Asia and Latin America: Is there a People's Republic of China Effect?

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# ABSTRACT

In recent years, the People's Republic of China (PRC) has emerged as the world's largest recipient of foreign direct investment (FDI). Many analysts and government officials in the developing world have expressed concern that they are losing competitiveness to the PRC. Is the PRC diverting FDI from other developing countries?

Theoretically, a growing PRC could add to other countries' FDI by creating more opportunities for *production networking* and raising the need for *raw materials* and resources. At the same time, the extremely low labor costs in the PRC might lure multinational enterprises (MNEs) away from other developing countries when they considered alternative locations for low-cost export platforms.

In this paper, we explore this important research and policy issue empirically. We focus on East and Southeast Asia as well as Latin America. For Asia, we use data for eight economies (Hong Kong, China, Taipei,China, Republic of Korea, Singapore, Malaysia, Philippines, Indonesia and Thailand) for 1985-2002, while for Latin America, we use data for sixteen economies (Argentina, Bolivia, Brazil, Chile, Columbia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela) for 1990–2002. We control for the standard determinants of inward direct investment. We then add the PRC's inward FDI as an indicator of the "PRC Effect." An estimation of the coefficient associated with the PRC Effect proxy gives us indications about its existence.

We obtain three results: (1) the level of the PRC's foreign direct investment is *positively* related to the levels of inward direct investments of economies in East and Southeast Asia, while it is mostly insignificant for Latin American economies; (2) the level of the PRC's FDI is *negatively* related to the direct investment into these economies as shares of total foreign direct investments in the developing countries; (3) the PRC Effect is generally not the most important determinant of inward direct investment for these economies. Market size and policy variables such as openness and corporate tax rates tend to be more important.

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# Foreign Direct Investment in East Asia and Latin America: Is there a People's Republic of China Effect?

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## 1.    Introduction

In recent years, the PRC has become a favorite destination for foreign direct investment (FDI). In 2002, FDI into the PRC reached US$53 billion. In 2003, despite the problems associated with SARS (Severe Acute Respiratory Syndrome), it received US$54 billion worth of FDI (UNCTAD 2004). It has become one of the world's top recipients of FDI.

The PRC is on its way to becoming "the factory of the world." Its success in attracting foreign direct investment is no accident. One of its earliest strategic policy reforms was to open up the South to foreign investors. Its attempts to introduce the market into its economy have gone hand in hand with the liberalization of its FDI regime. In some ways, the FDI reforms can be seen as the vanguard of domestic market reforms.

While increases in FDI from the outside world are complementary to the PRC's efforts to modernize its economy, many developing countries seem to be very worried about the prospects of a rising PRC absorbing more and more of the investment of major multinational enterprises (MNEs). Several governments in Asia and Latin America have publicly noted that the emergence of the PRC has diverted direct investment away from their economies. Policymakers and analysts in the developing world are convinced that its rise has contributed to the "hollowing out" phenomenon, with foreign and domestic investors leaving their countries and investing in the PRC instead. This in turn has led to a continued loss of manufacturing industries and jobs, they claim, further weakening the vitality of these economies.[1]

In this paper, we will examine empirically the question of whether the successful FDI policy of the PRC has diverted foreign direct investment away from a group of Asian and Latin American economies. In Asia, the economies we consider are Hong Kong, China, Taipei,China, the Republic of Korea, Singapore, Malaysia, Indonesia, the Philippines and Thailand. In Latin America, the economies we study are Argentina, Bolivia, Brazil, Chile, Columbia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. The research strategy is to control for the standard determinants of FDI and then add a proxy to represent "the PRC Effect." We then investigate the sign, significance and magnitude of this effect.

The organization of this paper is as follows. In Section 2, we provide some background discussion related to FDI in the PRC in general. In Section 3, we survey the relevant policy issues. In Section 4 we examine the current academic literature

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[1] The popular press has reported that in 2002, Mexico lost more than 200,000 jobs in the maquiladora assembly industry along the U.S.-Mexico border, as more than 300 companies moved to the PRC (*Miami Herald* 2003).

regarding the determination of FDI. In Section 5, we set up the empirical model to be estimated. In Section 6, we present and discuss our results. Section 7 concludes.

## 2. Some General Characteristics of FDI into the PRC

One of the most important elements of the PRC's economic reform has been the promotion of FDI inflows. FDI into the PRC has grown dramatically over the past two decades, since the launch of the "open-door" policy in 1978 (Table 1). At the time when the PRC initiated its "open-door" policy, the amount of FDI inflows was very small. It was not until the mid-1980s that FDI surged, marking the beginning of the PRC's ride on the wave of globalization. In the early 1990s, it once again gained momentum. After achieving unprecedented growth between 1991 and 1993 however, both the number of projects and the contracted value began to fall in 1994. This downturn continued until the next big wave of FDI inflows hit the PRC in 2000. In 2002, despite the widespread decline in global FDI, the PRC experienced an increase in FDI inflows and overtook the United States as the world's second largest destination of FDI.

**Table 1. Contracted and Realized FDI, 1979–2002**

US$ million/%

| Year | Contracted | | Realized | |
|---|---|---|---|---|
| | Amount | Growth Rate | Amount | Growth Rate |
| **1979-1982** | **6,010** | | **1,166** | |
| 1983 | 1,732 | | 636 | |
| 1984 | 2,651 | 53.1% | 1,258 | 97.8% |
| 1985 | 5,932 | 123.8% | 1,661 | 32.0% |
| 1986 | 2,834 | -52.2% | 1,874 | 12.8% |
| 1987 | 3,709 | 30.9% | 2,314 | 23.5% |
| 1988 | 5,297 | 42.8% | 3,194 | 38.0% |
| 1989 | 5,600 | 5.7% | 3,392 | 6.2% |
| 1990 | 6,596 | 17.8% | 3,487 | 2.8% |
| 1991 | 11,977 | 81.6% | 4,366 | 25.2% |
| 1992 | 58,124 | 385.3% | 11,007 | 152.1% |
| 1993 | 111,436 | 91.7% | 27,515 | 150.0% |
| 1994 | 82,680 | -25.8% | 33,767 | 22.7% |
| 1995 | 91,282 | 10.4% | 37,521 | 11.1% |
| 1996 | 73,277 | -19.7% | 41,725 | 11.2% |
| 1997 | 51,004 | -30.4% | 45,257 | 8.5% |
| 1998 | 52,102 | 2.2% | 45,463 | 0.5% |
| 1999 | 41,223 | -20.9% | 40,319 | -11.3% |
| 2000 | 62,380 | 51.3% | 40,715 | 1.0% |
| 2001 | 69,195 | 10.9% | 46,878 | 15.1% |
| 2002 | 82,768 | 19.6% | 52,743 | 12.5% |
| 1979-2002 | 827,809 | | 446,258 | |

*Source:* China Foreign Economic Statistical Yearbook.

Tables 2a and 2b present the contracted value and realized value of FDI from 15 leading investing territories, respectively. One of the features of FDI inflows into the PRC is the large contribution of investment from Hong Kong, China, Taipei,China and Macau, especially during the late 1980s and early 1990s. One of the PRC's reform strategies was to first open up Special Economic Zones (SEZs) in its southeast region in an attempt to attract foreign capital from its neighbors. Four SEZs were established in two southeast coastal provinces, Guangdong and Fujian. In Guangdong, three SEZs were established, in Shenzhen, Zhuhai, and Shantou. Shenzhen was a small town sharing a border with Hong Kong, a British colony at the time. Zhuhai is located next to Macao. Shantou is another coastal town near the border between Guangdong and Fujian. The fourth SEZ, Xiamen in Fujian province, is a relatively industrialized city, located near Taipei,China.

## Table 2a. Contracted FDI by Source Country/Territory, 1983–2002

US$10,000/%

| | 1983-1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 1992-2002 | 1983-2002 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | 5066740 | 5873545 | 1.1E+07 | 8267977 | 9128153 | 7327642 | 5100353 | 5210205 | 4122302 | 6237952 | 6919455 | 8276833 | 77607983 | 82674723 |
| Hong Kong, China | 3107746 | 4199377 | 7393852 | 4697141 | 4099555 | 2800172 | 1822229 | 1761328 | 1332892 | 1696105 | 2068586 | 2520183 | 34391420 | 37499166 |
| United States | 464887 | 314191 | 681275 | 601018 | 747113 | 691576 | 493655 | 648373 | 601611 | 800089 | 751487 | 815647 | 7146035 | 7610922 |
| Taipei,China | 0 | 554790 | 996487 | 539488 | 587907 | 514098 | 281449 | 298168 | 337444 | 404189 | 691419 | 674084 | 5879523 | 5879523 |
| Japan | 368782 | 220025 | 296047 | 444029 | 759236 | 513068 | 340124 | 274899 | 259128 | 368051 | 541973 | 529804 | 4546384 | 4915166 |
| Singapore | 92161 | 100255 | 295420 | 377796 | 866575 | 631440 | 46919 | 300152 | 225824 | 203074 | 198417 | 278548 | 3524420 | 3616581 |
| Virgin Islands | 560 | 4345 | 29856 | 83570 | 132115 | 312105 | 515571 | 613613 | 348749 | 752162 | 877177 | 1264980 | 4934243 | 4934803 |
| Korea | 0 | 42054 | 155669 | 180626 | 299839 | 423646 | 218098 | 164085 | 148385 | 238582 | 348740 | 528222 | 2747946 | 2747946 |
| United Kingdom | 78476 | 28741 | 198832 | 274838 | 357723 | 254238 | 144551 | 168159 | 108540 | 83418 | 151564 | 114199 | 1884803 | 1963279 |
| Germany | 116778 | 13434 | 24938 | 123314 | 165963 | 99809 | 61281 | 237467 | 93872 | 290009 | 117145 | 91532 | 1318764 | 1435542 |
| France | 24450 | 29165 | 23623 | 24813 | 64242 | 123539 | 108112 | 48884 | 47031 | 63440 | 56577 | 87886 | 677312 | 701762 |
| Macau, China | 0 | | 281466 | 172111 | 111529 | 44873 | 35865 | 30718 | 42656 | 34801 | 50300 | 63154 | 867473 | 867473 |
| Netherland | 22017 | 4143 | 15169 | 36582 | 60232 | 88921 | 56718 | 56268 | 67581 | 341412 | 97397 | 51629 | 876052 | 898069 |
| Canada | 33406 | 31578 | 118374 | 89033 | 98248 | 82256 | 90659 | 94679 | 69915 | 86843 | 129546 | 114843 | 1005974 | 1039380 |
| Malaysia | 6173 | 20928 | 75855 | 61734 | 106066 | 75737 | 49021 | 32591 | 26573 | 38851 | 47221 | 79284 | 613861 | 620034 |
| Australia | 33977 | 27583 | 63791 | 84892 | 125738 | 52162 | 61447 | 69899 | 58838 | 69668 | 67500 | 91044 | 772562 | 806539 |
| **Share in total** | **1983-1991** | **1992** | **1993** | **1994** | **1995** | **1996** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **1992-2002** | **1983-2002** |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Hong Kong, China | 61.3% | 71.5% | 66.4% | 56.8% | 44.9% | 38.2% | 35.7% | 33.8% | 32.3% | 27.2% | 29.9% | 30.4% | 44.3% | 45.4% |
| United States | 9.2% | 5.3% | 6.1% | 7.3% | 8.2% | 9.4% | 9.7% | 12.4% | 14.6% | 12.8% | 10.9% | 9.9% | 9.2% | 9.2% |
| Taipei,China | 0.0% | 9.4% | 8.9% | 6.5% | 6.4% | 7.0% | 5.5% | 5.7% | 8.2% | 6.5% | 10.0% | 8.1% | 7.6% | 7.1% |
| Japan | 7.3% | 3.7% | 2.7% | 5.4% | 8.3% | 7.0% | 6.7% | 5.3% | 6.3% | 5.9% | 7.8% | 6.4% | 5.9% | 5.9% |
| Singapore | 1.8% | 1.7% | 2.7% | 4.6% | 9.5% | 8.6% | 0.9% | 5.8% | 5.5% | 3.3% | 2.9% | 3.4% | 4.5% | 4.4% |
| Virgin Islands | 0.0% | 0.1% | 0.3% | 1.0% | 1.4% | 4.3% | 10.1% | 11.8% | 8.5% | 12.1% | 12.7% | 15.3% | 6.4% | 6.0% |
| Korea | 0.0% | 0.7% | 1.4% | 2.2% | 3.3% | 5.8% | 4.3% | 3.1% | 3.6% | 3.8% | 5.0% | 6.4% | 3.5% | 3.3% |
| United Kingdom | 1.5% | 0.5% | 1.8% | 3.3% | 3.9% | 3.5% | 2.8% | 3.2% | 2.6% | 1.3% | 2.2% | 1.4% | 2.4% | 2.4% |
| Germany | 2.3% | 0.2% | 0.2% | 1.5% | 1.8% | 1.4% | 1.2% | 4.6% | 2.3% | 4.6% | 1.7% | 1.1% | 1.7% | 1.7% |
| France | 0.5% | 0.5% | 0.2% | 0.3% | 0.7% | 1.7% | 2.1% | 0.9% | 1.1% | 1.0% | 0.8% | 1.1% | 0.9% | 0.8% |
| Macau, China | 0.0% | 0.0% | 2.5% | 2.1% | 1.2% | 0.6% | 0.7% | 0.6% | 1.0% | 0.6% | 0.7% | 0.8% | 1.1% | 1.0% |
| Netherland | 0.4% | 0.1% | 0.1% | 0.4% | 0.7% | 1.2% | 1.1% | 1.1% | 1.6% | 5.5% | 1.4% | 0.6% | 1.1% | 1.1% |
| Canada | 0.7% | 0.5% | 1.1% | 1.1% | 1.1% | 1.1% | 1.8% | 1.8% | 1.7% | 1.4% | 1.9% | 1.4% | 1.3% | 1.3% |
| Malaysia | 0.1% | 0.4% | 0.7% | 0.7% | 1.2% | 1.0% | 1.0% | 0.6% | 0.6% | 0.6% | 0.7% | 1.0% | 0.8% | 0.7% |
| Australia | 0.7% | 0.5% | 0.6% | 1.0% | 1.4% | 0.7% | 1.2% | 1.3% | 1.4% | 1.1% | 1.0% | 1.1% | 1.0% | 1.0% |
| Above 15 | 85.8% | 95.2% | 95.6% | 94.2% | 94.0% | 91.5% | 84.8% | 92.1% | 91.4% | 87.7% | 89.5% | 88.3% | 91.7% | 91.4% |

*Source:* China Statistical Yearbook, China Foreign Economic Statistical Yearbook, Almanac of China External Economies and Trade, various issues.
*Note:* Data for 1983–1992 include data of Foreign Direct Investment and Other Foreign Investment.

# Table 2b.  Realized FDI by Source Country/Territory, 1983–2002

US$10,000/%

| Country (Territory) | 1983-1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 1992-2002 | 1983-2002 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | 2329049 | 1100751 | 2751495 | 3376650 | 3752053 | 4174548 | 4527701 | 4546275 | 4031871 | 4071481 | 4687759 | 5274300 | 42294884 | 44623933 |
| Hong Kong, China | 1367575 | 750707 | 1727475 | 1966544 | 2006037 | 2067732 | 2063200 | 1850836 | 1636305 | 1549998 | 1671730 | 1786093 | 19076657 | 20444232 |
| United States | 258496 | 51105 | 206312 | 249080 | 308301 | 344333 | 323915 | 389844 | 421586 | 438389 | 443322 | 542392 | 3718579 | 3977075 |
| Taipei,China | 0 | 105050 | 313859 | 339104 | 316155 | 347484 | 328939 | 291521 | 259870 | 229658 | 297994 | 397064 | 3226698 | 3226698 |
| Japan | 311589 | 70983 | 132410 | 207529 | 310846 | 367935 | 432647 | 340036 | 297308 | 291585 | 434842 | 419009 | 3305130 | 3616719 |
| Singapore | 27014 | 12231 | 49004 | 117961 | 185122 | 224356 | 260641 | 340397 | 264249 | 217220 | 214355 | 233720 | 2119256 | 2146270 |
| Virgin Islands | 0 | | | | 30376 | 53761 | 171717 | 403134 | 265896 | 383289 | 504234 | 611739 | 2424146 | 2424146 |
| Korea | 0 | 11948 | 37381 | 72283 | 104289 | 135752 | 214238 | 180320 | 127473 | 148961 | 215178 | 272073 | 1519896 | 1519896 |
| United Kingdom | 33107 | 3833 | 22051 | 68884 | 91414 | 130073 | 185756 | 117486 | 104449 | 116405 | 105166 | 89576 | 1035093 | 1068200 |
| Germany | 40021 | 8857 | 5625 | 25899 | 38635 | 51831 | 99263 | 73673 | 137326 | 104149 | 121292 | 92796 | 759346 | 799367 |
| France | 20552 | 4493 | 14141 | 19204 | 28702 | 42375 | 47465 | 71489 | 88429 | 85316 | 53246 | 57560 | 512420 | 532972 |
| Macau, China | 0 | 20200 | 58650 | 50937 | 43982 | 58039 | 39455 | 42157 | 30864 | 34728 | 32112 | 46838 | 457962 | 457962 |
| Netherland | 6383 | 2841 | 8400 | 11105 | 11411 | 12511 | 41380 | 71882 | 54168 | 78948 | 77611 | 57175 | 427432 | 433815 |
| Canada | 6765 | 5824 | 13688 | 21605 | 25702 | 33793 | 34412 | 31652 | 31442 | 27978 | 44130 | 58798 | 329024 | 335789 |
| Malaysia | 566 | 2467 | 9142 | 20099 | 25900 | 45995 | 38183 | 34049 | 23771 | 20288 | 26298 | 36786 | 282978 | 283544 |
| Australia | 19241 | 3503 | 10996 | 18826 | 23299 | 19392 | 31374 | 27197 | 26331 | 30888 | 33560 | 38070 | 263436 | 282677 |
| **Share in total** | 1983-1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 1992-2002 | 1983-2002 |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Hong Kong, China | 58.7% | 68.2% | 62.8% | 58.2% | 53.5% | 49.5% | 45.6% | 40.7% | 40.6% | 38.1% | 35.7% | 33.9% | 45.1% | 45.8% |
| United States | 11.1% | 4.6% | 7.5% | 7.4% | 8.2% | 8.2% | 7.2% | 8.6% | 10.5% | 10.8% | 9.5% | 10.3% | 8.8% | 8.9% |
| Taipei,China | 0.0% | 9.5% | 11.4% | 10.0% | 8.4% | 8.3% | 7.3% | 6.4% | 6.4% | 5.6% | 6.4% | 7.5% | 7.6% | 7.2% |
| Japan | 13.4% | 6.4% | 4.8% | 6.1% | 8.3% | 8.8% | 9.6% | 7.5% | 7.4% | 7.2% | 9.3% | 7.9% | 7.8% | 8.1% |
| Singapore | 1.2% | 1.1% | 1.8% | 3.5% | 4.9% | 5.4% | 5.8% | 7.5% | 6.6% | 5.3% | 4.6% | 4.4% | 5.0% | 4.8% |
| Virgin Islands | 0.0% | | | | 0.8% | 1.3% | 3.8% | 8.9% | 6.6% | 9.4% | 10.8% | 11.6% | 5.7% | 5.4% |
| Korea | 0.0% | 1.1% | 1.4% | 2.1% | 2.8% | 3.3% | 4.7% | 4.0% | 3.2% | 3.7% | 4.6% | 5.2% | 3.6% | 3.4% |
| United Kingdom | 1.4% | 0.3% | 0.8% | 2.0% | 2.4% | 3.1% | 4.1% | 2.6% | 2.6% | 2.9% | 2.2% | 1.7% | 2.4% | 2.4% |
| Germany | 1.7% | 0.8% | 0.2% | 0.8% | 1.0% | 1.2% | 2.2% | 1.6% | 3.4% | 2.6% | 2.6% | 1.8% | 1.8% | 1.8% |
| France | 0.9% | 0.4% | 0.5% | 0.6% | 0.8% | 1.0% | 1.0% | 1.6% | 2.2% | 2.1% | 1.1% | 1.1% | 1.2% | 1.2% |
| Macau, China | 0.0% | 1.8% | 2.1% | 1.5% | 1.2% | 1.4% | 0.9% | 0.9% | 0.8% | 0.9% | 0.7% | 0.9% | 1.1% | 1.0% |
| Netherland | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.9% | 1.6% | 1.3% | 1.9% | 1.7% | 1.1% | 1.0% | 1.0% |
| Canada | 0.3% | 0.5% | 0.5% | 0.6% | 0.7% | 0.8% | 0.8% | 0.7% | 0.8% | 0.7% | 0.9% | 1.1% | 0.8% | 0.8% |
| Malaysia | 0.0% | 0.2% | 0.3% | 0.6% | 0.7% | 1.1% | 0.8% | 0.7% | 0.6% | 0.5% | 0.6% | 0.7% | 0.7% | 0.6% |
| Australia | 0.8% | 0.3% | 0.4% | 0.6% | 0.6% | 0.5% | 0.7% | 0.6% | 0.7% | 0.8% | 0.7% | 0.7% | 0.6% | 0.6% |
| Above 15 | 89.8% | 95.8% | 94.8% | 94.4% | 94.6% | 94.3% | 95.2% | 93.8% | 93.5% | 92.3% | 91.2% | 89.9% | 93.3% | 93.1% |

*Source:* China Statistical Yearbook, China Foreign Economic Statistical Yearbook, Almanac of China External Economies and Trade, various issues.
*Note:* Data for 1983–1986 include data of Foreign Direct Investment and Other Foreign Investment.

Throughout the years, Hong Kong, China has been by far the largest investor in the PRC. Its investment increased dramatically beginning in the early 1980s. Between 1983 and 2002, the contracted amount and realized amount of FDI from Hong Kong, China into the PRC amounted to more than US$375 billion and US$204 billion, respectively. These figures accounted for 45.4% and 45.8% of the total respective contracted amount and realized amount of FDI into the PRC from the world. However, it has been frequently estimated that a significant portion of investment from Hong Kong, China into the PRC originates from the PRC itself or from countries outside Hong Kong, China (Fung, 1997). A large amount of the PRC's capital outflow is channeled to Chinese firms located in Hong Kong, China and finds its way back into the PRC as FDI. This type of "round tripping" of funds is mostly used to avoid regulations such as barriers to trade or to gain eligibility for incentives available to only foreign investors (e.g. tax concessions). According to the World Bank (2002), round tripping accounts for twenty to thirty percent of FDI into the PRC.

Between 1983 and 2002, Singapore and Macao ranked sixth and twelfth in total contracted FDI in the PRC, and ranked sixth and eleventh, respectively in total realized FDI. The presence of both economies appears to have been stronger in the beginning of the 1990s.

While several East and Southeast Asian economies are among the top investors in the PRC, none of the Latin American economies are among the top fifteen. In the last few years, prices of commodities and raw materials such as copper, aluminum, cement, steel, petroleum and soybeans have soared, partly due to the breakneck pace of the PRC's industrialization. This seems to have benefited countries such as Brazil, Argentina and Venezuela, as the PRC became one of their largest export markets. But overall, the economic relationship between the PRC and Latin America, in contrast to that between the PRC and East and Southeast Asia, is still very primitive. Another difference between the Asian and Latin American economies is that there is increasing evidence that a vertical production and business network is thriving among the Asian economies (including the PRC) but not among the Latin American economies (Ando and Kimura 2003, Fukao and Okubo 2003).[2]

## 3. Recent Policy Concerns in Asia and Latin America

It is easy to find analysts, commentators and policymakers in Asia and Latin America voicing concerns about the emergence of the PRC and claiming that the PRC is adversely affecting direct investment flows into their economies. In November 2002, Singaporean Deputy Prime Minister Lee Hsien Loong (who has since become Prime Minister) stated, "Southeast Asian countries are under intense competitive pressure, as their former activities, especially labor-intensive manufacturing, have migrated to the PRC. One indicator of this massive shift is the fact that Southeast Asia used to attract twice as much foreign direct investment as Northeast Asia, but the ratio is reversed" (ChinaOnline, November 14, 2002). According to KOTRA (the state-run trade and investment promotion agency of the Republic of Korea), the rate of foreign direct

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[2] There is of course a production network between Mexico and the United States. But in this respect, Mexico is quite different from the rest of Latin America.

investment in most Asian countries is falling as global investors are drawn to the PRC (*Republic of Korea Times*, August 27, 2002). The World Economic Forum director for Asia, Frank J. Richter, said that if Asian countries do not take prudent and pragmatic steps toward being as competitive as the PRC, the foreign direct investment flows into these economies will be adversely affected (*New Straits Times-Management Times*, March 9, 2002). Furthermore, Taipei,China's Lin Hsin-I said that in the face of the rapid rise of the PRC economy, Taipei,China would have to take effective measures to increase its competitiveness. It would have to implement a "go south" policy to encourage companies to switch their investments from the Mainland to Southeast Asian countries (*Taiwanese Central News Agency*, November 21, 2002).

In Latin America, Cesar Gavina, head of the 34-country Organization of American States, was quoted as saying, "The fear of the PRC is floating in the atmosphere here. It has become a challenge to the Americas not only because of cheap labor, but also on the skilled labor, technological and foreign investment front." Panama Vice Minister of Foreign Affairs Nivia Rossana Casrellen said, "The FTAA is moving ahead because of the collective will to speed up development and a collective fear of the PRC" (*Miami Herald*, November 21, 2003). According to *Businessweek*'s Mexico City Bureau Chief, Geri Smith, "the PRC has siphoned precious investment and jobs from Mexico…" (*Businessweek*, November 8, 2004).

## 4.    Recent Academic Research on the Determinants of Foreign Direct Investment

Is the PRC's FDI policy a *friend* or a *foe* to other developing economies in Asia and in Latin America? What determines foreign direct investment flows into the Asian, Latin American and other economies? Is there a "PRC Effect"? To gain some insights into what methodology we should pursue, we will now look selectively at some recent relevant academic literature.[3]

Brainard (1997) empirically examines the determinants of the ratio of U.S. export sales to total foreign sales (the sum of export sales by sales by foreign affiliates) by industry. She uses a framework of focusing on factors that favor the concentration of production (i.e. those that favor exports) vs. proximity to overseas customers (i.e. those that favor sales by foreign affiliates). The explanatory variables include freight costs to the export market, tariffs of the host country, per capita gross domestic product, corporate tax rate, measures of trade and foreign direct investment openness, measures of plant scale economies and corporate scale economies. She also adds a dummy representing whether a country had a political coup during the last decade. In her estimation of random effects, nearly all the variables have the expected signs and are significant. The major exception is the corporate tax rate, which has the opposite sign as predicted.

Gastanaga, Nugent and Pashamova (1998) focus on policy reforms in developing countries as determinants of foreign direct investment inflows. They employ both ordinary least squares as well as panel estimations. The expected rates of growth, corporate tax rate, degree of corruption and degree of openness to foreign direct investment are all important determinants of foreign direct investment flows into these

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[3] This review is not meant to be exhaustive.

economies. Hines (1995) and Wei (1997) both examine the impact of institutional factors on foreign direct investment. By employing a corruption index, Hines shows that after 1977, U.S. FDI grew faster in less corrupt countries. Wei (1997) uses OECD direct investment data to show that both corruption and tax rate have negative effects on FDI flows. Wei's estimations are cross-sectional.[4] Fung, Iizaka and Parker (2002) and Fung, Iizaka and Siu (2003) use panel regressions to show that market size, labor costs and tax rates are important for determining various sources of FDI into different provinces of the PRC. Weiss (2004) provides an up-to-date review of the literature related to the investment and trade opportunities and threats of a rising PRC.

## 5. The Empirical Model

In this section we formulate an empirical model to estimate the impact of the PRC on the inward direct investment of various Asian and Latin American economies. For empirical studies on East and Southeast Asia, we examine Hong Kong, China, Singapore, Taipei,China, the Republic of Korea, Thailand, Malaysia, Philippines and Indonesia. For the Latin American empirical examinations, we include Argentina, Bolivia, Brazil, Chile, Columbia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. The strategy is to control for all the standard explanatory variables of FDI into these economies, and to add an additional variable representing the PRC factor. To proxy for it, we choose the level of the inflow of the PRC's FDI. Obviously Chinese inward FDI can also be dependent on the inward direct investment of these Asian and Latin American economies as well as the standard explanatory variables. In order to capture this reciprocal relationship between the inflow of FDI into the PRC and that into other economies, the FDI equation for both sets of these economies and the PRC must be estimated simultaneously.

The basic regression model for inward foreign direct investment for Asian and Latin American countries and for PRC are written as a linear specification of the following form:

$$\ln(FDI_{i,t}) = \alpha_0 + \alpha_1\ln(CFDI_t) + \beta_1\ln(GPCGDPR00_{i,t}) + \beta_2\ln(CORRUPT_{i,t}) + \beta_3\ln(DUTY_{i,t}) + \beta_4\ln(GOVT_{i,t}) + \beta_5\ln(WAGE_{i,t}) + \beta_6\ln(OPEN_{i,t}) + \beta_7\ln(ILLIT_{i,t}) + \beta_8\ln(CPTAX_{i,t}) + \beta_9\ln(TEL_{i,t}) + \beta_{10}\ln(GDPUSD_{i,t}) + \beta_{11}\ln(OUTFLOW_t) + \beta_{12}\ln(LAW_t) + \beta_{13}\ln(GGDPR_{it})$$

$$\ln(CFDI_t) = \gamma_0 + \delta_1\ln(FDI_{i,t}) + \rho_1\ln(GPCGDPR00_t) + \rho_2\ln(CCORRUPT_t) + \rho_3\ln(CDUTY_t)\ \rho_4\ln(CGOVT_t) + \rho_5\ln(CWAGE_t) + \rho_6\ln(COPEN_t) + \rho_7\ln(CILLIT_t) + \rho_8\ln(CPTAX_t) + \rho_9\ln(CTEL_t) + \rho_{10}\ln(CGDPUSD_t) + \rho_{11}\ln(OUTFLOW_t) + \rho_{12}\ln(LAW_t) + \rho_{13}\ln(GGDPR_t)$$

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[4] Other related literature includes Bao, Chang, Sachs and Woo (2002), Fung, Iizaka and Siu (2003), Zhang and Song (2001), etc.

where the subscripts "i" and "t" stand for country i at period t and the variables used in this analysis are defined below.

$FDI_{i,t}$ :  the level of inward foreign direct investment in the ith Asian or Latin American economy in year t.
$CFDI_t$ :  inward foreign direct investment into the PRC in year t.
$GGDPR_{i,t}$ :  growth rate of real GDP of country i at time t.
$CGDPR_t$ :  growth rate of real GDP of PRC at time t.
$CORRUPT_{i,t}$ :  an index of corruption of county i at time t.
$CCORRUPT_t$ :  an index of corruption of the PRC at time t.
$DUTY_{i,t}$ :  import duty of country i at time t.
$CDUTY_t$ :  import duty of PRC at time t.
$WAGE_{i,t}$ :  average wage in manufacturing of country i at time t.
$CWAGE_t$ :  average wage in manufacturing of PRC at time t.
$OPEN_{i,t}$ :  share of exports and imports in GDP of country i at time t.
$COPEN_t$ :  share of exports and imports in GDP of PRC at time t.
$ILLIT_{i,t}$ :  percentage of people who are illiterate of country i at time t.

$CILLIT_t$ :  percentage of people who are illiterate in the PRC at time t.
$TAX_{i,t}$ :  corporate tax rate of country i at time t.
$CTAX_t$ :  corporate tax rate of the PRC at time t.
$GOV_{i,t}$ :  an index of government stability of country i at time t.
$CGOV_t$ :  an index of government stability of the PRC at time t.
$TEL_{i,t}$ :  number of telephone mainlines per 1,000 people of country i at time t.
$CTEL_t$ :  number of telephone mainlines per 1,000 people of country i at time t.
$GPCGDP00_{i,t}$ :  growth rate of per capita GDP (base year 2000) of country i at time t.
$CGPCGDP00_t$ :  growth rate of per capita GDP (base year 2000) of PRC at time t.
$OUTFLOW_t$ :  total outflows of direct investment to the world at time t.
$LAW_{it}$ :  an index of rule of law of country i at time t.
$CLAW_t$ :  an index of rule of law of the PRC at time t.
$GDPUSD_{it}$ :  GDP in US dollars in country i at time t.
$CGDPUSD_t$ :  GDP in US dollars in the PRC at time t.

The independent variables examined in the analysis are believed to exert an influence on inward FDI into each country of East and Southeast Asia, Latin America and the PRC, by changing the investment environment through institutional and policy changes as well as the relevant economic conditions such as market size.

The main variable that we examine in this paper is the proxy for the PRC Effect, CFDI. There are two sets of arguments that we should consider here. First, in examining which low-wage export platform to locate in, MNEs may choose between investing in the PRC and investing in another country, such as Thailand or Mexico. In this case, the MNEs will study a whole host of factors, including wage rates, political risks, infrastructure, etc., which would make a country desirable as a site for low-cost production. Investing in the PRC would then reduce the FDI in another Asian or Latin American economies. The sign of CFDI, according to this argument, would be negative. We call this the "*investment-diversion effect.*"

The second aspect is the production and resource linkages between a growing PRC and the rest of Asia and parts of Latin America. In manufacturing, this takes the form of further specialization and growing fragmentation of the production processes. An investor sets up factories in the PRC, Thailand and Mexico to take advantage of their respective competitiveness in distinct stages of productions. Components and parts are then traded among the PRC and the other economies. An increase in the PRC's FDI is thus positively related to an increase in Thailand's or Mexican FDI. Lall and Weiss (2004) document some early signs of an electronics production network between the PRC and Mexico.

A different but complementary argument is that as the PRC grows, its market size increases and its appetite for minerals and resources also rises. Subsequently, foreign firms rush in to produce and sell in the PRC. At the same time, other MNEs also invest in other parts of Asia and Latin America to extract minerals and resources to export to the fast-growing PRC, which requires a whole spectrum of raw materials. These commodities include copper, steel, aluminum, petroleum, coal and soybeans. This line of reasoning leads one to predict that the sign of CFDI would be positive. We call this effect the "*investment-creation effect.*" Theoretically we cannot determine a priori the net effect of investment-creation and investment-diversion for the PRC. It is thus important to examine the issue empirically, as we attempt to do in this paper.

According to the academic literature that we have surveyed, there are *five* sets of standard determinants that we can control to isolate the PRC Effect. They are *market size* variables, *labor market* conditions, *institutional* variables, *policy* variables and the *global supply* of FDI. These are variables that we identify as important from our literature survey. We will discuss these sets of determinants next.

A substantial literature has developed confirming empirically the importance of the size of the host market and its growth rate. These are measured by GDP and the growth rate of real GDP per capita, or real GDP growth. The foreign investors who target the local market are assumed to be more attracted to a country with a higher growth rate of GDP as it indicates a larger potential demand for their products. In the literature, researchers have used both nominal and real GDP measures. As the variables (GDP, growth of real GDP and real per capita GDP) are used as indicators for the market size and the potential for the products of foreign investors, the expected signs for these variables are positive.

Labor market conditions include wage rate and quality of labor. Since the cost of labor is a major component of the cost function, various versions of the wage variables are frequently tested in the literature. A higher wage rate, other things being equal, deters inward FDI. This is particularly so for firms which engage in labor-intensive production activities. Therefore, conventionally, the expected sign for this variable is negative. However, there are no unanimous empirical results on the effects of labor costs on investment incentives in the existing literature. While some studies have shown no significant role for labor costs, others have shown a positive relationship between labor costs and FDI. The latter result is often attributed to the level of labor productivity or quality of human capital, which may be reflected in the wage variables.

The level of human capital is demonstrated to be another important determinant of the marginal productivity of capital. It has been shown in various studies that skill-related variables are host-country specific. When a host country is attracting

labor-intensive foreign investment that requires a relatively low level of skills, the importance of the human capital variable tends to be small. On the other hand, labor skills can be a more significant factor for a host country in which more capital- and technology-intensive investment projects are concentrated. In this analysis, we utilize the illiteracy rate as a proxy for the level of human capital.

We also examine the significance of institutional factors in the determination of FDI by incorporating the level of corruption along with an indicator of the rule of law and an indicator of the stability of each government. Corruption as well as a lack of the rule of law can discourage FDI by raising the cost of doing business. Hines (1995) shows that FDI from the United States grew more rapidly in less corrupt countries than in more corrupt countries after 1977. Wei (1997) presents an alternative explanation of the large negative and significant effect of corruption on FDI. Unlike taxes, corruption is not transparent and involves many factors that are arbitrary in nature. The agreement between a briber and a corrupt official is hard to enforce and creates more uncertainty over the total amount of questionable payments or the final outcome. Wei demonstrates that this type of uncertainty induced by corruption leads to a reduction in FDI. The political stability of the government and the sound rule of law can also be important factors in the inflow of FDI. An uncertain political environment and related risks can impede FDI inflows in spite of favorable economic conditions. Since the indices of corruption, instability and the rule of law assign higher scores to less corrupt, better law enforcement or more stable countries, the expected signs of the variables, CORRUPT, GOV and LAW, are all positive.

Also included in the analysis are policy-related variables, tariff barriers proxied by import duty, corporate tax rate, openness to foreign trade, and quality of infrastructure. The effect of tariffs on the behavior of MNEs is methodologically demonstrated by Horst (1971). He predicts that in the face of higher tariffs imposed by the host country, other things being equal, a MNE will increase its production abroad and decrease its exports. More recent models highlight the effect of tariffs on FDI within the context of vertical and horizontal specialization within MNEs. A typical vertical FDI can be characterized by individual affiliates specializing in different stages of production of the output. The semi-finished products in turn are exported to other affiliates for further processing. By fragmenting the production process, parents and affiliates take advantage of factor price differentials across countries. Horizontal specialization, on the other hand, involves each affiliate's engagement in similar types of production. A typical horizontal FDI can be associated with market-seeking behavior, with the motivation being to avoid trade costs. Choosing between engaging in horizontal FDI or exporting involves calculating the trade-off between trade costs and economies of scale.

MNEs that set up vertical production networks may be encouraged to invest in a country with relatively low tariff barriers, due to the lower cost of their imported intermediate products. Therefore, the expected sign of DUTY is negative. In contrast, high tariff barriers induce firms engaging in horizontal FDI to replace exports with production abroad by foreign affiliates (Brainard, 1997; Carr, Markusen, and Maskus, 2001). This "tariff jumping" theory implies a positive relationship between DUTY and FDI. Since the stylized fact regarding East Asia and Latin America is that business networks are in place in Asia but not in Latin America, the expected sign of DUTY in

the Asian regressions is negative, while for Latin America, it is positive (Fukao and Okubo 2003, Ando and Kimura 2003).

OPEN is included to examine the importance of openness of an economy to international trade. This variable measures the degree of general trade restrictions of each country. Following the same line of reasoning as above, a negative relationship between openness and market-seeking FDI is expected, and a positive relationship is expected for export-oriented FDI. In addition, in some economies, openness can be an indicator of economic reforms, where domestic reform and foreign trade reform go hand in hand. FDI can move preferentially to countries with deeper economic reforms.

Another policy-related variable that can influence the host country's location advantage is its corporate or other tax rates. MNEs, as global profit maximizers, can be assumed to be sensitive to tax factors, which have a direct effect on their profits. The evidence of significant negative influences of corporate tax rate is reported in previous studies by Wei (1997), Gastanaga, Nugent, and Pashamova (1998), and Hsiao (2001). Better-developed regions with superior infrastructure quality can also be more attractive to foreign firms relative to others. We test for this by including in our regressions, as a proxy, the number of telephone mainlines per 1,000 people. Fung, Iizaka and Parker (2002) as well as Fung, Iizaka and Siu (2003) show that at least in some instances, FDI is attracted to Chinese provinces with better infrastructure.

Finally, to control for the supply side of the direct investment, we include OUTFLOW, the total global outflows of FDI for each year. An increase in the global supply of FDI can raise FDI in all countries. This can create positive correlations among FDI inflows into various countries that are not related to the PRC Effect. We thus explicitly take this into account. All variables are transformed into logarithms. Data sources and additional explanations of variables are given in Appendix A. The empirical relationship is modeled as a simultaneous equation system and is estimated by the two stage least squares.

## 6.    Empirical Results: Is There a PRC Effect?

### 6.1  Results for East and Southeast Asia

#### 6.1.1   Does the PRC Reduce FDI inflows to the East and Southeast Asian Economies?

Table 3 shows the results from the first set of panel simultaneous regressions using the absolute level of FDI inflows as the dependent variables. To avoid the multicollinearity problem, variables that are highly correlated are not included simultaneously. This generates various specifications of our regressions. For our Asian regressions, the years considered are from 1985 to 2002.

**Table 3. Panel Regression Results with Levels of FDI in East and Southeast Asia**

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| CFDI | 0.1891*** | 0.2258*** | 0.0938* | 0.3151*** | 0.1171** | 0.3218*** | 0.1054* |
|  | (0.0362) | (0.0390) | (0.0556) | (0.0366) | (0.0557) | (0.0375) | (0.0588) |
| OPEN | 0.2969*** | 0.2787*** | 0.2257*** |  |  |  |  |
|  | (0.0360) | (0.0517) | (0.0520) |  |  |  |  |
| DUTY | -0.0726*** | -0.0770*** | -0.0854*** | -0.0671*** | -0.0865*** | -0.0749*** | -0.0867*** |
|  | (0.0170) | (0.0183) | (0.0175) | (0.0217) | (0.0200) | (0.0199) | (0.0183) |
| GDPUSD | 0.0079 | -0.0202 | -0.0333 | -0.2298*** | -0.1943*** | -0.2190*** | -0.1829*** |
|  | (0.0394) | (0.0588) | (0.0559) | (0.0477) | (0.0435) | (0.0486) | (0.0449) |
| ILLIT |  | 0.0754 | 0.1066** | 0.1258** | 0.1632*** | 0.1140** | 0.1443*** |
|  |  | (0.0490) | (0.0475) | (0.0551) | (0.0502) | (0.0565) | (0.0519) |
| CPTAX |  | -0.2337* | -0.2455** | -0.4332*** | -0.3781*** | -0.4066*** | -0.3818*** |
|  |  | (0.1204) | (0.1141) | (0.1154) | (0.1043) | (0.1208) | (0.1101) |
| GOVT |  | 0.0726 | 0.0926 | 0.0551 | 0.0819 | 0.0490 | 0.0866 |
|  |  | (0.0602) | (0.0573) | (0.0645) | (0.0582) | (0.0665) | (0.0611) |
| CORRUPT |  | 0.0091 | 0.0655 | -0.0528 | 0.0222 | -0.0185 | 0.0749 |
|  |  | (0.0843) | (0.0819) | (0.0970) | (0.0888) | (0.0977) | (0.0915) |
| LAW |  | -0.0941 | -0.0671 | 0.0303 | 0.0310 | -0.0179 | 0.0043 |
|  |  | (0.0872) | (0.0829) | (0.0894) | (0.0803) | (0.0928) | (0.0845) |
| OUTFLOW |  |  | 0.1816*** |  | 0.2426*** |  | 0.2579*** |
|  |  |  | (0.0587) |  | (0.0561) |  | (0.0588) |
| WAGE |  |  |  | 0.1353*** | 0.1143*** |  |  |
|  |  |  |  | (0.0320) | (0.0291) |  |  |
| TEL |  |  |  |  |  | 0.0837*** | 0.0575** |
|  |  |  |  |  |  | (0.2393) | (0.0226) |
| R-sqr | 0.6250 | 0.6505 | 0.6888 | 0.6088 | 0.6854 | 0.5885 | 0.6603 |
| Observations | 136 | 136 | 136 | 135 | 135 | 136 | 136 |

Standard errors are in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

A constant is included in the model but not reported.

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Our main variable of interest *CFDI* is *positive* and significant for all specifications. A 10 percent increase in FDI inflows into the PRC would raise the level of FDI inflows into East and Southeast Asian countries by about 1 to 3 percent, depending on the specifications. Despite considerable concern in policy circles that an increase in FDI flows to the PRC would come at the expense of those to other regional economies, this study demonstrates that those economies can actually benefit from it. This may be linked to production-networking activities among Asian countries as well as increased resource demand from a growing PRC. The evidence of production-networking between the PRC and other Asian economies can be found in a substantial two-way trade in intermediate and final goods in the same industries among those countries.[5]

Many of the countries examined are heavily involved in vertical specialization, particularly in the electrical equipment and electronics industries, as can be seen in the share of two-way trade in the same industry in the total volume of trade among the nations (Table 4). The economic ties of mutual dependence among them have been deepening rapidly since the 1990s. The significance of the PRC Effect on the level of FDI inflows into our group of Asian countries may reflect this interdependence. Thus, our empirical study shows that an increase in the PRC's FDI is positively and significantly related to FDI inflows into other Asian economies. Our central result here is then as follows: *up to now the investment-enhancing effect has dominated the investment-diversion effect*, so that overall the PRC has been a positive force for FDI inflows into other Asian economies.

**Table 4.  Two-Way Trade of Electric Equipment of the PRC with Its Neighbors, 2003**

|  | Exports of Electrical Equipment to the PRC (US$1,000) | Rank in Exports to the PRC | Imports of Electrical Equipment from the PRC (US$1,000) | Rank in Imports from the PRC |
|---|---|---|---|---|
| Taipei,China | 17,075,435 | 1 | 2,470,679 | 1 |
| Republic of Korea | 13,224,831 | 1 | 4,122,382 | 1 |
| Singapore | 3,432,677 | 1 | 2,869,225 | 1 |
| Thailand | 1,984,551 | 2 | 888,914 | 2 |
| Malaysia | 7,179,539 | 1 | 1,587,136 | 2 |
| Philippines | 4,251,766 | 1 | 890,895 | 1 |
| Indonesia | 346,577 | 7 | 632,660 | 3 |

*Source:*  Fung (2004), China Custom Statistics Monthly, 2003, December.

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[5] See also Ando and Kimura (2003) and Fukao and Okubo (2003).

The effect of openness, denoted by the variable *OPEN*, has the expected positive sign and is always significant. This variable captures the degree of both tariff and non-tariff measures including various trade costs. In contrast to the effect of tariff barriers proxied by DUTY, which is another significant variable, the impact of openness to trade on the inflow of FDI is substantial. The results shown in Table 3 suggest that, all else being equal, the marginal effect of trade liberalization of the Asian countries on the inflow of FDI can be more than twice as large as that of the PRC Effect. Trade impediments can take various forms such as local content requirements, technology transfer requirements, and domestic sales and export requirements. Our results imply that reductions in the various types of trade barriers could play a vital role in encouraging inflows of FDI into those countries.

Corporate tax is another variable that is found to exert a large influence on the level of inflows of FDI in this analysis. Although many countries offer various forms of tax incentives to foreign investors, the corporate tax rate can be considered as one of the most influential tools for promoting investment, since it has a direct impact on the profitability of investment projects. The effects of the corporate tax rate are in most cases larger than the PRC Effect.

For the East and Southeast Asian economies, the GDP variable is significant but seems to have the wrong sign. However, its significance disappears once DUTY is added into the regressions. This seems to indicate that it is not very robust. The degree of government stability, the index of corruption and the index for the rule of law, denoted as GOV, CORRUPT and LAW, are all insignificant. The OUTFLOW variables are positive and significant. They signify the impact of an overall "supply" effect on the inflows of FDI to these Asian economies. The proxy for infrastructure is also significant, though it has a very small coefficient.

Overall, the factors affecting FDI inflows into East and Southeast Asia are the positive PRC Effect, policy variables such as the degree of openness to trade and the quality of infrastructure, and the world supply of FDI.[6]

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[6] For related robustness tests of these regression results, see Chantasasawat et al (2003).

*6.1.2 Does the PRC Reduce the East and Southeast Asian Economies' Shares of Total FDI Inflows to Developing Economies?*

In this empirical exercise, we change the dependent variable from the level of FDI, to the country's *share* of the total FDI flowing into all developing countries (Table 5). The idea is to test the notion that some government officials may be concerned about their *share*, rather than simply *level* of FDI. Here we found that the PRC Effect is negative and significant. This means that the PRC *does* reduce the shares of these economies out of the total FDI inflows to all developing countries. Furthermore, the PRC Effect is large.

OPEN and DUTY are, as in the regressions with levels, significant. Corporate tax rate has the expected negative signs. The index of government stability has a small, but significant, positive coefficient. Infrastructure is also positive and significant. However, the labor market variables including the wage rate and the degree of illiteracy, seem to have the wrong signs.[7] Overall, the dominant determinants of the Asian economies' shares of FDI into all developing countries are the (negative) PRC Effect, policy variables such as openness to trade, corporate tax rate and infrastructure, and the institutional factor of government stability.

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[7] As discussed above, wage rates are often found to be positively related to FDI in previous empirical studies of FDI.

**Table 5.  Panel Regression Results Using Shares of Total FDI Flowing into Developing Countries**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| CFDI | -0.8683*** | -0.8249*** | -0.5849*** | -0.7597*** | -0.7692*** | -0.5749*** | -0.7535*** | -0.5500*** |
| | (0.0485) | (0.0446) | (0.0569) | (0.0397) | (0.0374) | (0.0561) | (0.0371) | (0.0553) |
| OPEN | 0.2678*** | 0.1902*** | 0.2170*** | | | | | |
| | (0.0455) | (0.0475) | (0.0402) | | | | | |
| DUTY | -0.0922*** | -0.0934*** | -0.0740*** | -0.0865*** | -0.1040*** | -0.0886*** | -0.0958*** | -0.0806*** |
| | (0.0210) | (0.0198) | (0.0170) | (0.0209) | (0.0217) | (0.0196) | (0.0194) | (0.0174) |
| GDPUSD | -0.0029 | -0.0620 | -0.0711 | -0.1918*** | -0.1916*** | -0.2164*** | -0.1933*** | -0.2175*** |
| | (0.0525) | (0.0650) | (0.0544) | (0.0513) | (0.0470) | (0.0419) | (0.0492) | (0.0434) |
| GPCGDPR00 | -0.0698 | | | | | | | |
| | (0.1092) | | | | | | | |
| ILLIT | | 0.1241** | 0.0756* | 0.1151** | 0.1688*** | 0.1388*** | 0.1677*** | 0.1292*** |
| | | (0.0528) | (0.0452) | (0.0559) | (0.0558) | (0.0498) | (0.0551) | (0.0491) |
| CPTAX | | -0.2915** | -0.3142*** | -0.4872*** | -0.3684*** | -0.4228*** | -0.3936*** | -0.4333*** |
| | | (0.1376) | (0.1153) | (0.1201) | (0.1181) | (0.1052) | (0.1260) | (0.1107) |
| GOVT | | 0.1374** | 0.0920* | 0.1348* | 0.1077* | 0.0960* | 0.1300** | 0.0959* |
| | | (0.0637) | (0.0540) | (0.0689) | (0.0631) | (0.0558) | (0.0638) | (0.0563) |
| OUTFLOW | | | -0.3088*** | | | -0.2347*** | | -0.2507*** |
| | | | (0.0569) | | | (0.0556) | | (0.0569) |
| CORRUPT | | | | 0.1410 | | | | |
| | | | | (0.0930) | | | | |
| LAW | | | | 0.0967 | 0.1004 | 0.0558 | | |
| | | | | (0.0963) | (0.0692) | (0.0620) | | |
| WAGE | | | | | 0.0970*** | 0.1065*** | | |
| | | | | | (0.0292) | (0.0259) | | |
| TEL | | | | | | | 0.0672*** | 0.0711*** |
| | | | | | | | (0.0184) | (0.0161) |
| R-Sqr | 0.8740 | 0.8931 | 0.9244 | 0.8950 | 0.9054 | 0.9261 | 0.8963 | 0.9201 |
| Observations | 136 | 136 | 136 | 136 | 135 | 135 | 136 | 136 |

Standard errors are in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
A constant is included in the model but not reported.

*6.2 Empirical Results for Latin America: Is There a PRC Effect?*

*6.2.1 Does the PRC Reduce FDI Inflows into Latin America?*

In the following table, we present results for the levels of FDI inflows into various Latin American economies (Table 6). For the Latin American regressions, the years we examine are 1990-2002. In contrast to the corresponding regressions for East and Southeast Asia, the PRC Effect variable is in most cases *insignificant*. Even when they are significant (columns (3), (5) and (8)), the magnitudes of the coefficients are quite small, generally smaller than those in the regressions for Asia. This is consistent with the fact that the similarity of exports between the PRC and the Latin American economies is still rather modest (Lall and Weiss 2005). With the exception of Mexico, multinational firms in general do not view the PRC and Latin American countries as competing sites for processing their products. We thus do not find a systematic negative PRC Effect.

On the other hand, there is no network of production sharing in place between the PRC and Latin America, as there is with the rest of Asia. There are indications that in electronics, a production fragmentation network may be forming between the PRC and Mexico (Lall and Weiss 2004). At the same time, the PRC's appetite for commodities may also spur flows of FDI into the primary sectors of certain Latin American economies. This may explain the occasional positive sign of the PRC Effect. In sum, for Latin America, the PRC Effect is either insignificant or very mildly positive.

Levels of FDI in Latin America are mostly explained by their market sizes, growth rates, the global supply of FDI, and import barriers. In the Latin American regressions, higher trade barriers are correlated with more FDI, indicating a motivation for tariff-jumping FDI. The positive sign of DUTY also indicates the lack of a production network, since in the production and trade of intermediate goods, FDI would be correlated with lower trade barriers in general. This contrasts with the results from the Asian regressions, where DUTY is negative and significant, a fact which tends to be consistent with the existence of an East and Southeast Asian production network. A thriving business and production network in East and Southeast Asia (including the PRC) in contrast to the relative lack of such clusters of production in Latin America, may explain the different estimated results for Asia and Latin America.[8]

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[8] Ando and Kimura (2003) found that at least for machinery (including general machinery, electric machinery, transport equipment and precision machinery), there is a deep production network in East Asia (with the PRC). But Latin American economies are not forming production networks.

### Table 6. Panel Regression Results with Levels of FDI Inflows into Latin America

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| CFDI | 0.0914 | 0.0887 | 0.1796** | 0.1089 | 0.1520* | 0.1075 | 0.1213 | 0.1860** |
| | (0.0968) | (0.0950) | (0.0810) | (0.0854) | (0.0886) | (0.1078) | (0.0919) | (0.0813) |
| GDPUSD | 0.9523*** | 0.9199*** | 0.9638*** | 1.0225*** | 0.9473*** | 0.9341*** | 0.9824*** | 0.9736*** |
| | (0.0884) | (0.0880) | (0.0971) | (0.1358) | (0.0977) | (0.1222) | (0.1209) | (0.0950) |
| OUTFLOW | 0.5759*** | 0.6397*** | 0.5796*** | 0.5289*** | 0.4413*** | 0.6128*** | 0.4337** | 0.5656*** |
| | (0.1268) | (0.1267) | (0.1159) | (0.1300) | (0.1629) | (0.1740) | (0.1730) | (0.1172) |
| GPCGDPR00 | | 0.5338*** | 0.6837** | 0.6212** | 0.5133* | 1.2165*** | 0.4781 | |
| | | (0.1823) | (0.2766) | (0.2836) | (0.2900) | (0.4304) | (0.3017) | |
| DUTY | | | 0.4185*** | 0.4276*** | 0.3713** | 0.4122* | 0.3850** | 0.4363*** |
| | | | (0.1562) | (0.1566) | (0.1815) | (0.2300) | (0.1829) | (0.1570) |
| OPEN | | | | 0.3463 | | | 0.1968 | |
| | | | | (0.3112) | | | (0.3007) | |
| ILLIT | | | | -0.0011 | | | -0.0715 | |
| | | | | (0.2817) | | | (0.2641) | |
| TEL | | | | 0.1620 | | | 0.0203 | |
| | | | | (0.2748) | | | (0.2764) | |
| GOVT | | | | | 0.2938 | | 0.2774 | |
| | | | | | (0.2794) | | (0.2861) | |
| CORRUPT | | | | | -0.3595 | | -0.2970 | |
| | | | | | (0.2798) | | (0.2875) | |
| CPTAX | | | | | -0.1027 | | -0.1191 | |
| | | | | | (0.1552) | | (0.1561) | |
| LAW | | | | | 0.2649 | | 0.2598 | |
| | | | | | (0.2010) | | (0.2048) | |
| WAGE | | | | | | 0.0583 | | |
| | | | | | | (0.0709) | | |
| GGDPR | | | | | | | | 0.5561* |
| | | | | | | | | (0.2926) |
| R-sqr | 0.7544 | 0.7629 | 0.7880 | 0.7939 | 0.8019 | 0.7371 | 0.8078 | 0.7871 |
| Observations | 208 | 208 | 181 | 181 | 169 | 118 | 169 | 181 |

Standard errors are in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
A constant is included in the model but not reported.

*6.2.2  Does the PRC Reduce Latin American Economies' Shares of Total FDI Inflows into Developing Countries?*

In the following table, we present our panel regression results using the Latin American economies' shares of FDI flows into all developing countries as the dependent variable (Table 7). The PRC Effect in this case is negative and significant. As in the regressions with levels, other variables that are significant include the size of the market, growth of per capita income and extent of trade restrictions. Even though the PRC Effect is negative and significant here, its effect is much smaller compared to the market size variables. DUTY as an explanatory variable also has a larger coefficient. Thus, even if policymakers are concerned with their countries' FDI shares, the dominant influence here does not seem to be the emergence of the PRC.

## Table 7. Panel Regression Results Using Shares of Developing Countries

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| CFDI | -0.2187*** | -0.2575*** | -0.3115*** | -0.2976*** | -0.3112*** | -0.3318*** | -0.4414*** | -0.3096*** |
| | (0.0588) | (0.0696) | (0.0743) | (0.0765) | (0.0767) | (0.0845) | (0.1155) | (0.0903) |
| GDPUSD | 0.9514*** | 0.9377*** | 0.9303*** | 0.9995*** | 1.0000*** | 0.9843*** | 1.0519*** | 1.0048*** |
| | (0.0974) | (0.0946) | (0.0948) | (0.1137) | (0.1169) | (0.1245) | (0.1783) | (0.1197) |
| GPCGDPR00 | 0.5295** | 0.4992* | 0.4952* | 0.4591* | 0.4716* | 0.4656* | 1.1089** | 0.4907* |
| | (0.2648) | (0.2657) | (0.2656) | (0.2692) | (0.2710) | (0.2739) | (0.4386) | (0.2834) |
| DUTY | 0.3979*** | 0.3577** | 0.3367** | 0.3441** | 0.3480** | 0.3480** | 0.2769 | 0.3522** |
| | (0.1510) | (0.1542) | (0.1560) | (0.1557) | (0.1567) | (0.1572) | (0.2197) | (0.1595) |
| LAW | | 0.2190 | 0.2892 | 0.2618 | 0.2614 | 0.2827 | 0.3496 | 0.2526 |
| | | (0.1815) | (0.1890) | (0.1905) | (0.1922) | (0.1898) | (0.2747) | (0.1935) |
| CORRUPT | | | -0.2634 | -0.2028 | -0.1894 | -0.2139 | -0.2340 | -0.1852 |
| | | | (0.2636) | (0.2643) | (0.2659) | (0.2656) | (0.3194) | (0.2673) |
| GOVT | | | 0.1876 | | | | | |
| | | | (0.1974) | | | | | |
| OPEN | | | | 0.2862 | 0.3110 | 0.2650 | 0.6822 | 0.3222 |
| | | | | (0.2861) | (0.2855) | (0.2962) | (0.4682) | (0.2929) |
| ILLIT | | | | | -0.0697 | | -0.0678 | -0.0620 |
| | | | | | (0.1947) | | (0.2154) | (0.2047) |
| TEL | | | | | | 0.0843 | | |
| | | | | | | (0.1835) | | |
| WAGE | | | | | | | 0.0598 | |
| | | | | | | | (0.0705) | |
| OUTFLOW | | | | | | | | 0.0043 |
| | | | | | | | | (0.1186) |
| R-sqr | 0.7559 | 0.7637 | 0.7639 | 0.7705 | 0.7706 | 0.7687 | 0.7364 | 0.7708 |
| Observations | 181 | 181 | 181 | 181 | 181 | 181 | 118 | 181 |

Standard errors are in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
A constant is included in the model but not reported.

## 7. Conclusion

The PRC's development strategy involving the attraction of foreign firms has been a huge success. Its external "open door" reforms are complementary to its internal policies to privatize its economy. But is the PRC's FDI policy *detrimental or complementary* to attempts by other economies in Asia and Latin America to attract increased foreign direct investment? In other words, is it diverting foreign direct investment away from other Asian and Latin American economies? This is the paramount question on the minds of many academic researchers as well as policymakers in Latin America and Asia.

Theoretically, the emergence of the PRC can have both *investment-creating* as well as *investment-diverting* effects on other economies. In this paper, we examine this issue empirically.

We use data for eight Asian economies (Hong Kong, China, Taipei,China, Republic of Korea, Singapore, Malaysia, Philippines, Indonesia and Thailand) and data from sixteen Latin American economies (Argentina, Bolivia, Brazil, Chile, Columbia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela) and estimate the determinants of foreign direct investment inflows into these economies. The standard determinants we consider include market size variables (real GDP growth rate, growth rates of real per capita income and GDP), policy variables (degree of openness, corporate tax rate, import duties, quality of infrastructure) institutional characteristics (indices of corruption, degrees of government stability, indices of the rule of law), labor market conditions (illiteracy rate and wage rate) as well as the global supply of FDI. To estimate the PRC Effect, we include in the empirical equations the levels of the PRC's inward foreign direct investment. As the PRC's foreign direct investment should also be dependent on foreign direct investment into other Asian and Latin American economies and other similar policy and institutional factors, we use a panel regression simultaneous equation model to estimate our coefficients, paying particular attention to the estimated coefficient of the PRC Effect.

The main results of our paper are as follows. First, in terms of the levels of foreign direct investment flows, the PRC Effect is *positive* for the East and Southeast Asian economies. For the Latin American economies, the PRC Effect is mostly *insignificant* and occasionally *mildly positive*. In other words, foreign direct investments into the Asian economies are positively related to direct investment into the PRC, while foreign direct investments into the Latin American economies have little systematic relationship with direct investment into the PRC.

These results are consistent with the view that there is a thick and growing *production network* within the Asian economies and the PRC, but with the exception of Mexico, there is relatively little vertical production-sharing among the Latin American countries. Thus, multinationals may want to set up factories and distribution networks in both the PRC and other parts of Asia to accommodate their increasingly sophisticated global supply chains, but they do not seem to view the PRC and Latin America systematically as rival, alternative sites of business networks. *Second*, in terms of the *shares* of developing countries' foreign direct investments, the PRC effect is *negative* for both the East and Southeast Asian economies as well as for the Latin American economies. Thus while both the level of the PRC's foreign direct investment and the

levels of foreign direct investments of Asian economies are increasing together and there is no strong relationship between foreign direct investment into the PRC and into Latin America, an increase in the PRC's investment is associated with a decline in the Asian and Latin American shares of foreign direct investment of all developing economies. *Third*, the PRC effect is in general *not* the most important factor determining the inflows of foreign direct investments into these economies. Specifically, market size variables and policy variables such as lower corporate taxes and higher degrees of openness play larger roles in attracting investment.

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**Appendix A: Definitions and Sources of Variables**

*FDI*: Aggregate foreign direction investment inflows from the UNCTAD.

*GDPUSD*: GDP in US dollars from EconStats.

*GPCGDPR00*: Growth of per capita GDP with 2000 as base year. Per capita GDP data are from EconStats.

*GGDPR*: Growth of real GDP. Real GDP data are from EconStats.

*DUTY*: Import duties data are from IMF's *Government Finance Statistic Yearbook* with supplements from individual countries' statistical yearbooks and national statistical agency websites.

*OPEN*: Openness = (Export + Import)/ GDP. Export and Import as a percentage of GDP are from *World Development Indicators.*

*ILLIT*: Illiteracy rate is the percentage of people ages 15 and above who cannot, with understanding, read and write a short, simple statement on their everyday life; from *World Development Indicators*.

*TEL*: Telephone mainlines (per 1,000 people). *World Development Indicators* provide data, which are from the International Telecommunication Union.

*GOVT*: An index of government stability from *International Country Risk Guide (ICRG)* from the PRS Group. The range is from 0 to 12. A higher score means higher stability of a government.

*CORRUPT*: An index of corruption from *International Country Risk Guide (ICRG)* from the PRS Group. It ranges from 0 to 6, where a higher number indicates a lower level of corruption.

*LAW*: An index of Law and Order from *International Country Risk Guide (ICRG)* from the PRS Group. It ranges from 0 to 6, where a higher number indicates a better system of law and order.

*CPTAX*: Corporate income tax rate, measured in percentage points, from Price Waterhouse's "*Worldwide Summary*" book.

*WAGE*: Average wage in manufacturing, from the International Labor Organization (ILO)'s LABORSTA and countries' statistical yearbooks and national statistical agency website.

*OUTFLOW*: Total world outflows of foreign direct investment from the UNCTAD.

Taipei,China's data are mostly from *Statistical Yearbook of Republic of China* and its official website