

# Understanding bilateral FDI flows in developing Asia

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Unlike trade flows, there has been little to no detailed examination of foreign direct investment (FDI) flows between Asian economies. This paper uses bilateral FDI flows data to investigate trends in intra-Asian FDI flows over the period 1990–2005. It employs an augmented gravity model to identify the main determinants of intra-Asian FDI flows. Possible drivers of FDI flows, including transactional and informational distance (proxied by distance), real sector variables, financial variables and quality of institutions are examined.

## Introduction

Many Asian companies have become significant foreign direct investors. According to some rough estimates, in 2004, intra-Asian foreign direct investment (FDI) flows accounted for about 40 per cent of Asia's total FDI inflows [Kwan and Cheung 2006; UN Conference on Trade and Development (UNCTAD) 2006:Chapter 2]. If correct, this share is broadly comparable with the extent of intra-Asian trade flows. However, unlike trade flows, there has been little examination of FDI flows between Asian economies at a bilateral level. This paper uses bilateral FDI flows data to investigate trends in and drivers of intra-Asian FDI flows over the period 1997 to 2004–05. Eichengreen

and Tong (2007), Liu et al. (2007) and Sudsawasd and Chaisrisawatsuk (2006) are three of just a handful of papers that examine FDI to Asia using bilateral data. However, these papers only consider FDI from OECD economies.<sup>1</sup> In contrast, the focus of this paper is on developing Asian economies as the sources of FDI to other developing Asian economies, using data from UNCTAD.

The most common definition of FDI is based on the OECD *Benchmark Definition of FDI* (3rd edition, 1996) and IMF *Balance of Payments Manual* (5th edition, 1993). According to this definition, FDI generally has two broad characteristics. First, as a matter of convention, FDI involves a 10 per cent threshold value of ownership.<sup>2</sup> Second, FDI consists of both the initial transaction that creates (or liquidates)

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1 A selective list of recent papers that use bilateral FDI data from the OECD but are not specifically limited to Asia are Bénassy-Quéré et al. (2007), Daude and Stein (2004), Head and Ries (2008), Loungani et al. (2002), Razin et al. (2003), and Stein and Daude (2007).

2 The 10 per cent threshold is not always adhered to by all countries. For a detailed overview of the FDI definitions and coverage in selected developing and developed countries, see IMF (2003). Also see Duce (2003). UNCTAD (2007) discusses data issues pertaining to FDI inflows to China.

investments, as well as subsequent transactions between the direct investor and the direct investment enterprises aimed at maintaining, expanding or reducing investments. More specifically, FDI is defined as consisting of three broad aspects, viz. new foreign equity flows (which are the foreign investor's purchases of shares in an enterprise in a foreign country), intra-company debt transactions (which refer to short-term or long-term borrowing and lending of funds, including debt securities and trade credits between the parent company and its affiliates), and reinvested earnings (which comprise the investor's share of earnings not distributed as dividends by affiliates or remitted to the source country, but rather reinvested in the host country). New equity flows could either take the form of mergers and acquisitions (M&A) of existing local enterprises or 'greenfield' investments.

For developing economies, the two most comprehensive databases on FDI inflows and outflows are IMF-BoP Manual and UNCTAD (see Duce 2003 for a comparison of the two sources). Neither source divides FDI into M&A and greenfield investments.<sup>3</sup> UNCTAD has by far the most complete FDI database, and, unlike the IMF-BoP data, it compiles data on *bilateral* FDI flows—both inflows and outflows. The UNCTAD data are on a net basis (capital transaction credits less debits between direct investors and their foreign affiliates), and are mainly sourced from national authorities (central banks or statistical offices).

The remainder of the paper is organized as follows. The second section discusses broad patterns in intra-Asia FDI flows using bilateral net FDI flows over the period 1990–2005. The third section employs an augmented gravity model framework to examine the main determinants of intra-Asian FDI flows using bilateral data based on a panel dataset. While many different versions of gravity models have been used to understand intra-OECD FDI flows and

FDI flows from OECD economies to developing economies in Asia and elsewhere, this paper applies such a framework to intra- (developing) Asian FDI flows. We examine a range of drivers of FDI flows, including transactional and informational distance (proxied by distance), real sector variables, financial variables, and institutional quality. As far as we know, ours is one of the few papers that attempts to determine the drivers behind FDI flows between developing Asia economies. The final section offers a few concluding remarks. An important caveat is in order. The aim of this paper is *not* to compare determinants of intra-Asian FDI flows with intra-OECD or global FDI flows. Rather, the focus of this paper is on documenting the extent of intra-Asian FDI and exploring its determinants.<sup>4</sup>

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### The Extent of Intra-Asian FDI Flows: Trends and Patterns

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One could analyse FDI data on *stocks* (that is, international investment positions) or *flows* (that is, financial account transactions). While much empirical analysis has been undertaken using the former, changes in stocks could arise either because of net new flows or because of valuation changes and other adjustments (such as write-offs and reclassifications). To avoid these valuation and other changes, we consider only data on flows of outward FDI (net decreases in assets, or when investments come from a foreign country) and inward FDI (net increases in liabilities, or when the source country invests abroad). Our focus is on selected South, Southeast, and East Asian developing economies: Bangladesh, Cambodia, Mainland China, Hong Kong SAR, India, Indonesia, Malaysia, Pakistan, the Philippines, Singapore, Taiwan POC, Thailand, South Korea and Vietnam. Thus, apart from excluding West

3 See UNCTAD (2006:15–21) for a discussion of greenfield versus M&A investments. In the past three years, cross-border M&As have been surging. While most M&A statistics are compiled from commercial data sources, they tend to include *announced* rather than *actual* financial flows; and some of the announced flows may not even include activities considered to be FDI (as defined above).

4 Hattari and Rajan (2008) explores differences in intra-Asian FDI versus FDI to Asia from extra-regional sources.

Asia and some smaller economies in South, Southeast and East Asia, we exclude Japan but follow UNCTAD in defining the newly industrialised economies (NIEs) like Hong Kong SAR, Singapore, South Korea and Taiwan POC as 'developing'.

### Aggregate inflows to and outflows from developing Asia

Table 1 shows shares of global FDI inflows and outflows. As is apparent, the Triad (the EU, Japan and the USA) continue to dominate, both as sources and destinations of FDI and in terms of both stocks and flows. However, note that in 2003–05 the Triad's share of FDI flows declined to a low of below 60 per cent compared with about 80 per cent on average between 1978 and 1990, while the share of developing economies rose to a high of 40 per cent—over half of which was destined for Asia. The share of FDI outflows from developing economies, which was negligible until the mid-1980s, rose to about 15 per cent of world outflows in 2005. According to UNCTAD (2006), the stock of outward FDI from developing economies rose from around US\$70 billion in 1980 to about US\$150 billion in 1990, and to more than US\$1 trillion in 2005.

Table 2 focuses on FDI inflows and outflows of selected Asian developing economies between 1990 and 2005. Between 1990 and 1996, FDI inflows to Asia grew at an average annual amount of just over US\$50 billion, while outflows grew at US\$30 billion annually. Buoyant global economic conditions and the liberalisation of most of the Asian economies in the early 1990s led to an influx of FDI inflows. In contrast, during 1997–2005, average annual FDI growth in outflows from Asia outpaced inflows to Asia (US\$20–25 billion on average compared with US\$50 billion annually). Further, FDI outflows and inflows for most countries during the subperiods 1990–1996 and 1997–2005 are positively correlated, with the exceptions of Korea (first subperiod),

the Philippines (second subperiod) and Bangladesh (entire period). The correlations in Greater China (Mainland plus Hong Kong SAR) and India are particularly high, suggesting that periods of economic liberalisation have been characterised by simultaneous rises in FDI inflows and outflows (Table 3).

The two countries with the highest inflows and outflows are Mainland China and Hong Kong SAR. In both sample periods, Mainland China was the single largest destination for FDI, accounting for about two-fifths of inflows to developing Asia during the past 15 years. For the period 1990–1996, the average annual FDI inflow to Mainland China was around US\$20 billion, while for the second subperiod the average annual FDI inflow exceeded US\$50 billion. Hong Kong SAR is clearly the single largest source of FDI from Asia. FDI outflows from Hong Kong SAR averaged just under US\$15 billion annually in the first subperiod and over US\$25 billion in the second subperiod.<sup>5</sup> A large part of outflows from Hong Kong SAR is bound for Mainland China, some of which is because of 'round-tripping' from the Mainland. This round-tripping significantly inflates the amount of outward FDI from the Mainland, which experienced a spurt between 1990 and 2005 (UNCTAD 2006:12).<sup>6</sup>

Referring again to Table 2, apart from Hong Kong SAR and Mainland China, the three NIEs, Singapore, South Korea and Taiwan POC, have been consistently among the top developing economy sources of FDI over the last two decades. Malaysia (a near NIE) is also notable for the size of its outward FDI flows, particularly since the 1990s. While there is not necessarily a one-to-one link between nationality of transnational corporations (TNCs) and FDI outflows, the handful of firms from developing economies that made the top 100 list were from Hong Kong SAR, Taiwan POC, Mainland China, Singapore, Korea and Malaysia. TNCs from the first four economies (that is, Greater China and Singapore) constituted 60

5 Chen and Lin (2006) discuss patterns and determinants of FDI outflows from Hong Kong SAR and Mainland China.

6 Estimates place round-tripping between Hong Kong and the Mainland at between 25 and 50 per cent of total FDI flows from Hong Kong SAR to Mainland China (UNCTAD 2006:12).

**Table 1**  
**Distribution of foreign domestic investment (FDI) by region and selected countries, 1980–2005**  
 (per cent)

Region	Inward stock				Outward stock			
	1980	1990	2000	2005	1980	1990	2000	2005
Developed economies	75.6	79.3	68.5	70.3	87.3	91.7	86.2	86.9
European Union	42.5	42.9	37.6	44.4	37.2	45.2	47.1	51.3
Japan	0.6	0.6	0.9	1.0	3.4	11.2	4.3	3.6
USA	14.8	22.1	21.7	16.0	37.7	24.0	20.3	19.2
Developing economies	24.4	20.7	30.3	27.2	12.7	8.3	13.5	11.9
Africa	6.9	3.3	2.6	2.6	1.3	1.1	0.7	0.5
Latin America and the Caribbean	7.1	6.6	9.3	9.3	6.5	3.4	3.3	3.2
Asia	10.5	10.8	18.4	15.4	2.9	3.8	9.5	8.2
West Asia	1.4	2.2	1.1	1.5	0.3	0.4	0.2	0.3
South, East and Southeast Asia	8.8	8.5	17.2	13.8	2.5	3.4	9.3	7.6
Southeast Europe and CIS	—	0.01	1.2	2.5	—	0.01	0.3	1.2
World	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

  

Region	Inflow				Outflow			
	1978–80	1988–90	1998–2000	2003–05	1978–80	1988–90	1998–2000	2003–05
Developed economies	79.7	82.5	77.3	59.4	97.0	93.1	90.4	85.8
European Union	39.1	40.3	46.0	40.7	44.8	50.6	64.4	54.6
Japan	0.4	0.04	0.8	0.8	4.9	19.7	2.6	4.9
USA	23.8	31.5	24.0	12.5	39.7	13.6	15.9	15.7
Developing economies	20.3	17.5	21.7	35.9	3.0	6.9	9.4	12.3
Africa	2.0	1.9	1.0	3.0	1.0	0.4	0.2	0.2
Latin America and the Caribbean	13.0	5.0	9.7	11.5	1.1	1.0	4.1	3.5
Asia	5.3	10.5	11.0	21.4	0.9	5.6	5.1	8.6
West Asia	-1.6	0.3	0.3	3.0	0.3	0.5	0.1	1.0
South, East and Southeast Asia	6.7	10.0	10.7	18.4	0.6	5.1	5.0	7.7
Southeast Europe and CIS	0.0	0.02	0.9	4.7	—	0.01	0.2	1.8
World	100.0	100.0	99.9	100.0	100.0	100.0	100.0	100.0

**Source:** UN Conference on Trade and Development foreign direct investment/transnational corporation database.  
 CIS, Commonwealth of Independent States.

**Table 2**  
**FDI inflows and outflows of selected Asian countries**  
(in billions of US dollars)

<i>Country</i>	1990–96	1997–2005	1997	1998	1999	2000	2001	2002	2003	2004	2005
<b>Inflows</b>											
World	248.30	816.23	489.71	712.03	1,099.92	1,409.57	832.25	617.73	557.87	710.75	916.28
Asia (excluding Japan)	51.31	114.56	100.40	91.06	108.66	143.83	103.99	88.61	93.72	137.02	163.72
New Industrial Asia	9.18	21.55	18.64	12.60	29.13	30.06	23.62	11.83	14.72	24.45	28.91
Korea	2.34	5.75	2.64	5.07	9.63	8.65	3.87	3.04	3.89	7.73	7.20
Singapore	5.89	13.60	13.75	7.31	16.58	16.48	15.65	7.34	10.38	14.82	20.08
Taiwan POC	0.95	2.21	2.25	0.22	2.93	4.93	4.11	1.45	0.45	1.90	1.63
China	25.00	76.40	56.63	60.23	64.90	102.64	70.65	62.42	67.13	94.66	108.30
China: Mainland	20.43	50.88	45.26	45.46	40.32	40.71	46.88	52.74	53.51	60.63	72.41
Hong Kong SAR	4.57	25.52	11.37	14.76	24.58	61.92	23.78	9.68	13.62	34.03	35.90
ASEAN-4	8.48	8.50	16.13	11.72	9.37	4.83	1.66	5.84	4.32	8.62	14.05
Indonesia	2.71	0.19	4.68	-0.24	-1.84	-4.55	-2.98	0.15	-0.60	1.90	5.26
Malaysia	3.62	3.50	6.32	2.71	3.90	3.79	0.55	3.20	2.47	4.62	3.97
Philippines	0.92	1.17	1.25	1.75	1.25	2.24	0.20	1.54	1.49	1.69	1.13
Thailand	1.23	3.63	3.88	7.49	6.09	3.35	3.89	0.95	1.95	1.41	3.69
South Asia	2.44	5.90	5.34	3.87	3.21	4.65	6.38	6.97	5.70	7.29	9.75
India	1.38	4.42	3.62	3.63	2.17	3.59	5.47	5.63	4.59	5.47	6.60
Pakistan	0.34	0.79	0.71	0.51	0.53	0.31	0.38	0.82	0.53	1.12	2.18
Sri Lanka	0.09	0.23	0.43	0.15	0.20	0.17	0.17	0.20	0.23	0.23	0.27
Bangladesh	0.63	0.47	0.58	0.58	0.31	0.58	0.35	0.33	0.35	0.46	0.69

**Table 2**  
(Continued)

<i>Country</i>	1990–96	1997–2005	1997	1998	1999	2000	2001	2002	2003	2004	2005
<b>Outflows</b>											
World	269.72	776.31	483.14	696.40	1,108.17	1,244.47	764.20	539.54	561.10	813.07	778.73
Asia (excluding Japan)	29.14	50.05	51.23	31.69	39.87	80.69	48.35	33.76	21.15	76.11	67.63
New industrial Asia	8.92	16.87	20.60	10.74	16.62	17.62	28.07	9.79	12.25	20.32	15.86
Korea	2.25	3.98	4.45	4.74	4.20	5.00	2.42	2.62	3.43	4.66	4.31
Singapore	3.62	7.40	10.90	2.16	8.00	5.92	20.17	2.29	3.14	8.51	5.52
Taiwan POC	3.05	5.49	5.24	3.84	4.42	6.70	5.48	4.89	5.68	7.15	6.03
China	17.21	29.22	26.97	19.62	21.14	60.27	18.23	19.98	5.34	47.52	43.87
China: Mainland	2.32	3.36	2.56	2.63	1.77	0.92	6.89	2.52	-0.15	1.81	11.31
Hong Kong SAR	14.89	25.85	24.41	16.98	19.37	59.35	11.35	17.46	5.49	45.72	32.56
ASEAN-4	2.94	2.96	3.57	1.20	1.98	2.28	0.60	2.26	2.17	6.17	6.44
Indonesia	0.91	0.80	0.18	0.04	0.07	0.15	0.13	0.18	0.01	3.41	3.07
Malaysia	1.44	1.73	2.68	0.86	1.42	2.03	0.27	1.90	1.37	2.06	2.97
Philippines	0.16	0.17	0.14	0.16	0.13	0.13	-0.14	0.07	0.30	0.58	0.16
Thailand	0.43	0.26	0.58	0.13	0.35	-0.02	0.35	0.11	0.49	0.13	0.25
South Asia	0.07	1.00	0.10	0.11	0.13	0.52	1.45	1.72	1.38	2.09	1.46
India	0.07	0.95	0.11	0.05	0.08	0.51	1.40	1.68	1.33	2.02	1.36
Pakistan	0.00	0.03	-0.02	0.05	0.02	0.01	0.03	0.03	0.02	0.06	0.04
Sri Lanka	0.00	0.01	0.01	0.01	0.02	0.00	0.00	0.01	0.03	0.01	0.04
Bangladesh	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.01	0.01

**Source:** UN Conference on Trade and Development FDI/transnational corporation database.  
FDI, foreign direct investment; ASEAN, Association of Southeast Asian Nations.

**Table 3**  
**Correlations between inflows and outflows to and from Asia**

Country	1990–96	1997–2005
Asia	1.0	0.9
New Industrial Asia	0.9	0.5
Korea	−0.4	0.6
Singapore	0.9	0.5
Taiwan POC	0.1	0.4
China	1.0	0.8
China: Mainland	0.2	0.6
Hong Kong SAR	0.9	0.9
ASEAN-4	0.8	0.5
Indonesia	0.1	0.6
Malaysia	0.9	0.8
Philippines	0.7	−0.1
Thailand	0.8	0.1
South Asia	0.4	0.8
India	0.8	0.9
Pakistan	0.4	0.4
Sri Lanka	0.8	0.1
Bangladesh	−0.4	−0.1

Source: Authors' calculation.  
 ASEAN, Association of Southeast Asian Nations.

per cent of the top 100 TNC from developing economies (UNCTAD 2006:Chapter 1).

### Intraregional Asian FDI flows: a first look

Having considered broad country aggregate outflows and inflows to and from Asia, we analyse bilateral FDI flows between Asian economies. This exercise is far from straightforward. UNCTAD data on inflows and outflows do not match exactly (also see UNCTAD 2006:Chapter 3). It is apparent that UNCTAD FDI outflows data from source countries are incomplete for many countries. While some source countries have relatively complete data on outflows, others either have incomplete data or no data at all. Different reporting practices

for FDI data create bilateral discrepancies between FDI flows reported by source and host countries—and the differences can be quite large. For example, data on FDI flows to Mainland China, as reported by the Chinese authorities and by the investing countries' authorities, differ by roughly US\$30 billion in 2000, by US\$8 billion in 2001 and by US\$2 billion in 2002.<sup>7</sup> Faced with these concerns, we draw inferences on FDI flows by examining FDI inflow data reported by the host economies, as they are more complete and are available for all developing Asian economies under consideration. In other words, we focus on the *sources of inflows* rather than the *destination of outflows*. To keep the analysis manageable, we examine averages for the period 1997–2000 and 2001–05, rather than analyse annual data.<sup>8</sup>

FDI inflows between Asian countries account for about one-third of all FDI inflows to the region (Table 4). This is particularly the case between and within East Asian and Southeast Asia economies. Table 5 shows that the bilateral flows between East Asian countries are the highest in Asia, with an average of US\$28 billion for the period 1997–2005. According to Table 6, the average of FDI flows from Hong Kong SAR to Mainland China and vice versa from 1997 to 2005 has been around US\$24 billion and accounts for almost 48 per cent of intra-Asia flows. Apart from Hong Kong SAR–Mainland China–Taiwan POC flows, other East and South-East Asia bilateral flows are also significant. Almost three-fifths of flows from East Asia to South-East Asia went to the relatively higher-income Southeast economies, viz., Singapore, Malaysia, Philippines and Thailand. Singapore has attracted about half of all East Asian FDI destined for Southeast Asia. The city state has also been a major investor in China. Malaysia and Thailand have also invested strongly in China.

Consideration of intra-Asian bilateral flows highlights a few other important characteristics

7 Apart from round-tripping and trans-shipping issues (discussed later in this section), part of the data inconsistencies between inflows and outflows arise because many countries do not include retained earnings or loans when considering FDI outflows.

8 The top destinations for FDI, based on FDI inflow data from host economies and FDI outflow data from source economies have stayed roughly the same during the period under consideration.

**Table 4**  
**Average of intra-Asian bilateral FDI outward flows**  
 (in millions of US dollars, unless otherwise noted)

	Host region <sup>a</sup>					
	(1997–2000)			(2001–05)		
	Asia <sup>b</sup>	In per cent of Asia	In per cent of world	Asia <sup>b</sup>	In per cent of Asia	In per cent of world
Source countries						
New industrial Asia	11,051.3	28.7	1.2	9,490.7	27.0	1.4
Korea	656.4	1.7	0.1	276.8	0.8	0.0
Singapore	7,018.5	18.2	0.8	5,197.2	14.8	0.8
Taiwan POC	3,376.5	8.8	0.4	4,016.6	11.4	0.6
ASEAN-4	1,101.2	2.9	0.1	1,129.2	3.2	0.2
Indonesia	254.9	0.7	0.0	194.5	0.6	0.0
Malaysia	376.6	1.0	0.0	433.3	1.2	0.1
Philippines	180.4	0.5	0.0	263.8	0.8	0.0
Thailand	289.3	0.8	0.0	237.6	0.7	0.0
China	26,226.6	68.2	2.8	24,436.0	69.6	3.6
Mainland China	7,356.8	19.1	0.8	5,651.7	16.1	0.8
Hong Kong SAR	18,869.8	49.1	2.0	18,784.3	53.5	2.8
India	43.9	0.1	0.0	34.9	0.1	0.0
Low-income Asia	10.7	0.0	0.0	5.5	0.0	0.0
Bangladesh	0.2	0.0	0.0	0.5	0.0	0.0
Cambodia	0.5	0.0	0.0	3.1	0.0	0.0
Lao PDR	2.6	0.0	0.0	-0.5	0.0	0.0
Myanmar	4.7	0.0	0.0	2.2	0.0	0.0
Sri Lanka	2.7	0.0	0.0	0.2	0.0	0.0
Vietnam	0.0	0.0	0.0	0.0	0.0	0.0
Other Asia	26.4	0.1	0.0	17.4	0.0	0.0
Pakistan	1.4	0.0	0.0	6.2	0.0	0.0
Brunei Darusalam	25.1	0.1	0.0	11.1	0.0	0.0
Developing Asia <sup>c</sup>	27,408.9	71.3	3.0	25,623.0	73.0	3.8
Asia <sup>b</sup>	38,460.2	100.0	4.1	35,113.6	100.0	5.2

<sup>a</sup> Asia data is based on FDI inflow data in host economy; world data is based on FDI outflow from source economy.

<sup>b</sup> Asia consists of newly industrialised Asia, ASEAN-4, China, India, low-income Asia and other Asia.

<sup>c</sup> Developing Asia consists of ASEAN-4, China, India, low-income Asia, and other Asia.

**Source:** UN Conference on Trade and Development FDI/transnational corporation database. FDI, foreign direct investment; ASEAN, Association of Southeast Asian Nations.

of intra-Asian FDI flows (Tables 5 and 6). First, the leading investors from the region remained the same between 1997 to 2006, with Hong Kong SAR as the leading investor, followed by Singapore, Taiwan POC, Korea, Mainland China, and Malaysia, in that order. The importance of Mainland China as a source of capital is

noteworthy in that there has been a great deal of debate over whether China has diverted extra-regional FDI from the rest of Southeast and East Asia (for instance, see Chantasawat et al. 2004; Eichengreen and Tong 2007; Liu et al. 2007; Mercereau 2005; Sudsawasd and Chairrisawat-suk 2006).<sup>9</sup> While Hong Kong SAR's FDI to the

<sup>9</sup> That said, the bulk of FDI flows from China have been to Hong Kong SAR. However, there is evidence of growing investment by China into Southeast Asia.

**Table 5**  
**Average intra-Asian bilateral FDI outward flows<sup>a</sup>**  
 (in millions of US dollars)

	Host region					
	(1997–2000)			(2001–05)		
	East Asia <sup>b</sup>	Southeast Asia <sup>c</sup>	South Asia <sup>d</sup>	East Asia <sup>b</sup>	Southeast Asia <sup>c</sup>	South Asia <sup>d</sup>
Source region						
East Asia <sup>b</sup>	28,453.6	1,604.2	201.6	27,482.5	1,168.1	78.9
Southeast Asia <sup>c</sup>	6,328.7	1,748.7	86.6	3,622.3	2,641.7	111.1
South Asia <sup>d</sup>	0.0	43.4	5.2	0.0	27.9	14.6
Rest of the world	45,393.3	20,845.5	3,971.4	49,070.8	20,403.7	4,060.3

<sup>a</sup> Based on FDI inflow data in host economy.

<sup>b</sup> East Asia consists of China, Hong Kong SAR, Korea, Taiwan POC, Macau SAR and Mongolia.

<sup>c</sup> South-East Asia consists of Brunei Darussalam, Cambodia, Lao PDR, Malaysia, Myanmar, Singapore, Philippines, Thailand and Vietnam.

<sup>d</sup> South Asia consists of Bangladesh, India, Maldives, Sri Lanka and Pakistan.

**Source:** UN Conference on Trade and Development FDI/transnational corporation database.

FDI, foreign direct investment.

Mainland has remained stable between the two subperiods, that from the Mainland to Hong Kong SAR has declined. Second, intra Southeast Asia investment accounted for 6.7 per cent of cumulative FDI flows in Asia between 1997 and 2005. Comparing the two sample periods, intra Southeast Asia's investment share of cumulative FDI flows in Asia increased between the two periods from 3.6 to 7.4 per cent, with Singapore the leading investor in both periods. Singapore's investments to its ASEAN neighbors, Malaysia and Thailand, have increased in the second subperiod, while the city state's investments to Mainland China and especially Hong Kong SAR have declined. Third, FDI flows between East Asia and South Asia remain low.

It is important to note that the data examined above exclude the offshore financial

centers (OFCs), such as the British Virgin islands (BVI), Bermuda, Cayman Islands, Mauritius, Samoa and Vanuatu as sources of FDI. Insofar as at least some part of inflows from the OFCs involve FDI that originated from other Asian economies, and the inflows are not destined to go back to the originating country (that is, trans-shipping as opposed to round-tripping), we may be undercounting the size of intra-Asian FDI flows. For instance, the BVI has consistently been the second largest source of FDI into Mainland China, surpassed only by Hong Kong SAR, with the Cayman Islands and Samoa also being among the top 10 in 2006.<sup>10</sup> Similarly, investments from other sources may have been rerouted to India via Mauritius, which has consistently been the top source of FDI into India.<sup>11</sup>

10 Source: Ministry of Commerce of China. In the literature, OFCs have mainly been discussed in the context of bank flows and portfolio flows. For instance, see Dixon (2001), Rose and Spiegel (2006) and Zoromé (2007).

11 Mauritius has a low corporate tax rate and has signed a liberal double taxation agreement with India. As such, the true extent of flows of FDI between India and East and Southeast Asia may be understated. Many companies from abroad and in India use Singapore as a regional headquarters, particular following the signing of a bilateral Comprehensive Economic Cooperation Agreement. However, Pardhan (2005) has argued that outward investments from Indian multinationals since the mid-1990s have been more global in nature.

**Table 6**  
**Top 50 bilateral flow between Asian countries<sup>a</sup>**  
 (in million of US dollars)

Source	Host	Average		In per cent to Asia	
		(1997–2000)	(2001–05)	(1997–2000)	(2001–05)
Hong Kong SAR	China	17,750.8	17,819.1	46.2	50.7
China	Hong Kong SAR	7,266.9	5,459.4	18.9	15.5
Singapore	China	2,706.3	2,136.7	7.0	6.1
Singapore	Hong Kong SAR	2,835.3	353.1	7.4	1.0
Singapore	Malaysia	844.1	1,133.8	2.2	3.2
Singapore	Thailand	441.7	1,381.9	1.1	3.9
Malaysia	China	290.8	316.7	0.8	0.9
Hong Kong SAR	Malaysia	272.3	296.5	0.7	0.8
Hong Kong SAR	Thailand	360.1	160.8	0.9	0.5
Korea	Hong Kong SAR	313.0	155.7	0.8	0.4
Thailand	China	185.8	183.7	0.5	0.5
Philippines	China	135.9	212.2	0.4	0.6
Hong Kong SAR	Singapore	250.1	81.9	0.7	0.2
Malaysia	Hong Kong SAR	62.0	147.2	0.2	0.4
Singapore	Philippines	88.9	76.1	0.2	0.2
Hong Kong SAR	Korea	79.2	51.5	0.2	0.1
Thailand	Hong Kong SAR	-3.1	110.7	0.0	0.3
Hong Kong SAR	Philippines	50.0	54.4	0.1	0.2
Singapore	India	22.0	67.6	0.1	0.2
China	Singapore	-17.3	99.9	0.0	0.3
China	Philippines	71.8	-0.1	0.2	0.0
India	Singapore	36.8	24.9	0.1	0.1
Philippines	Thailand	4.9	48.4	0.0	0.1
China	Cambodia	18.3	33.4	0.0	0.1
Malaysia	Cambodia	24.9	16.7	0.1	0.0
Malaysia	Thailand	19.4	21.2	0.1	0.1
Singapore	Cambodia	19.6	12.9	0.1	0.0
Thailand	Cambodia	19.1	13.4	0.0	0.0
Philippines	Malaysia	6.3	18.7	0.0	0.1
Malaysia	Bangladesh	5.1	19.4	0.0	0.1
Philippines	Singapore	37.5	-15.6	0.1	0.0
Thailand	Malaysia	10.2	11.1	0.0	0.0
Malaysia	Lao PDR	17.4	0.9	0.0	0.0
Thailand	Lao PDR	15.2	1.9	0.0	0.0
China	Malaysia	11.5	5.1	0.0	0.0
Pakistan	Bangladesh	1.3	10.7	0.0	0.0
China	Thailand	0.4	10.8	0.0	0.0
China	Lao PDR	3.9	6.6	0.0	0.0
Malaysia	Philippines	6.5	2.4	0.0	0.0
Singapore	Myanmar	0.0	8.7	0.0	0.0
Thailand	Myanmar	0.0	5.6	0.0	0.0
Myanmar	Singapore	4.1	1.1	0.0	0.0
China	Myanmar	0.0	4.7	0.0	0.0
Thailand	Philippines	3.0	0.8	0.0	0.0
Singapore	Lao PDR	1.0	2.3	0.0	0.0
Cambodia	Thailand	0.6	2.7	0.0	0.0
China	Bangladesh	1.2	1.0	0.0	0.0
Lao PDR	Thailand	2.3	-0.4	0.0	0.0

<sup>a</sup> Based on FDI inflow data in host economy.

**Source:** UN Conference on Trade and Development FDI database.  
 FDI, foreign direct investment.

## Determinants of FDI Flows to Emerging Asia

The previous section has highlighted the extent of FDI outflows from developing countries, and, more specifically, the intensification of intra-regional FDI flows. But what explains the rise of intra-regional FDI flows in Asia? This section undertakes an empirical investigation of some of the possible determinants of FDI flows from emerging Asia to the rest of the region over the period 1990–2005. Can a gravity model framework that is commonly used to rationalise outward FDI flows from OECD economies be used to understand intra-Asian FDI flows?

### The model

We develop a relatively parsimonious gravity model that includes commonly used determinants, as well as focusing on bilateral variables. To this end, we follow the basic gravity framework, which argues that market size and distance are important determinants in the choice of location of direct investment. The theoretical basis for a gravity model of FDI has recently been proposed by Head and Ries (2008). The model has been used in a host of papers with some variations.<sup>12</sup>

The basic specification of our estimated model is as follows:

$$\ln(FDI_{ijt}) = \beta_0 + \beta_1 \ln(GDP_{it}) + \beta_2 \ln(GDP_{jt}) + \beta_3 LANG + \beta_4 \ln(DIST_{ij}) + \beta_5 X_{ijt} + \eta_i + \mu_j + \lambda_t + v_{ijt} \quad (1)$$

where:  $FDI_{ijt}$  is the real FDI flow from source country ( $i$ ) to host country ( $j$ ) in time ( $t$ );  $GDP_{it}$  and  $GDP_{jt}$  are real GDP in US dollars for the

source country ( $i$ ) and the host country ( $j$ ) in time ( $t$ );  $LANG$  is a binary variable equal to 1 if the source and host countries have a common official language;  $DIST_{ij}$  is the geographical distance between the host and source countries;  $X_{ijt}$  is a vector of explanatory variables influencing FDI outflows;  $\eta_i$  denotes the unobservable type of source country effects (we use source country dummies);  $\mu_j$  denotes the unobservable type of host country effects (we use host country dummies);  $\lambda_t$  denotes the unobservable time effects (we use year dummies); and  $v_{ijt}$  is a nuisance term.<sup>13</sup>

The set of explanatory variables used are: real GDP per capita differentials of the host and source countries, the lag of real export of goods from the source country to the host country, the change in the bilateral real exchange rate of the source country with respect to the host country, the ratio of stock market capitalisation to GDP of the host country's stock market, average corporate tax rates in the host country, a political risk index in the host country, a binary variable equal to 1 if the country's legal system originated from British common law system, and a binary variable equal to 1 if the source and host countries have an operational free trade agreement (FTA); and a financial openness index for the host country.

**Basic gravity variables.** We expect the coefficients of the real GDP of the source and destination countries to be positive as they proxy for masses, which are important in gravity models.<sup>14</sup> A destination country that has a large market tends to attract more FDI. The sign of the source country size is ambiguous. While large real GDP indicates greater aggregate income and therefore higher ability to invest abroad, small real GDP implies limited market size and a consequent desire by companies to expand their wings overseas to gain market share. The sign for common language ought to

12 The augmented gravity model for FDI is broadly similar—but by no means identical—to those used in recent papers, including Loungani et al. (2002), Stein and Daude (2007) and Liu et al. (2007). di Giovanni (2005) applies a gravity model to analyse cross-border M&A transactions, while Portes and Rey (2005) apply a gravity model for portfolio equity flows.

13 According to CEPI's website, geographical distance is calculated following the great circle formula, which uses latitudes and longitudes of the most important cities/agglomerations (in terms of population).

14 In physics, the law of gravity states that the force of gravity between two objects is proportional to the product of the masses of the two objects divided by the square of the distance between them. Most gravity models in bilateral trade and FDI have replaced the force of gravity with the value of bilateral trade or direct investments, and the masses with the source and destination countries' GDP.

be positive, while the sign for distance from the source to the host country should be negative, as greater distance between countries makes a foreign operation more difficult and expensive to supervise and might therefore discourage FDI.<sup>15</sup>

**Real explanatory variables.** The expected sign of the difference in real GDP per capita (source minus host) is unclear, depending on whether FDI flows are vertical or horizontal in nature. Similarly, the nexus between FDI and trade is ambiguous *a priori*. Insofar as both are a means of servicing a market, they could be competitive in nature. On the other hand, their relationship could be complementary if FDI is export oriented or if greater exports increase familiarity with a country, hence stimulating FDI inflows as well. Clearly, there may be issues of reverse causality between FDI and exports. Therefore, we lag the exports variables by one period.<sup>16</sup> We also hypothesise that the change in the real exchange rate should have a negative sign, as a real exchange rate depreciation of the host country (that is, fall in the index) should raise FDI flows from the source country (because of the wealth effect). However, there are other channels that could lead to ambiguity of the sign (Cushman 1985).

**Financial explanatory variables.** As with di Giovanni (2005), we also test if the greater financial depth of the host country impacts bilateral FDI flows. We proxy financial depth by the stock market capitalisation of the host country. This variable could also be suggestive of general bullishness in and robustness of economic activity, thus generating capital inflows. Apart from financial depth, the link between financial liberalisation and international capital flows is of great importance to emerging market policymakers. We therefore also test whether financial openness can lead to more FDI flows, when controlling for other factors using the Chinn–Ito index.

**Institutional quality and other variables.** Anghel (2005), Bénassy-Quéré et al. (2007), and Daude and Stein (2004) have explored the importance of institutional variables in FDI flows. We include a Political Risk Index—broadly defined to reflect government stability, socioeconomic conditions, investment climate, internal and external conflict, corruption, involvement of the military in politics, religious tensions, law and order, ethnic tensions, democratic accountability, and bureaucratic quality—of the International Country Risk Group (ICRG) database. (The higher the index, the higher is the overall institutional quality.) La Porta et al. (1996) have emphasised how different commercial laws provide different levels of protection of corporate shareholders and creditors, and quality of law and enforcement. Therefore, the other institutional quality variable we include is a binary variable equal to 1 if the sample countries' legal system originated from British common law.<sup>17</sup>

We also included two other explanatory variables sometimes used in other studies: corporate taxes and free trade agreements (FTAs). Higher corporate taxes in the host country should deter FDI.<sup>18</sup> FTAs in the form of regional trade agreements and bilateral trade agreements between emerging Asian countries have proliferated rapidly (Table 7). It is commonly believed that FTAs tend to stimulate FDI flows (for instance, see Levy Yeyati et al. 2002). We examine this linkage by including dummies for operational bilateral trade agreements.<sup>19</sup>

## Data and methodology

Tables A1 to A3 summarise the data sources to be used. The FDI data are based on the UNCTAD FDI/TNC database (in millions of US dollars). We deflated these data by the 1996 US Consumer Price Index (CPI) for urban

15 However, if the foreign firm is looking to service the destination country's market, a longer distance also makes exporting from source countries more expensive and might therefore make local production more desirable and encourage investment. This argument is not unlike the tariff-jumping one.

16 As a robustness check, we also excluded exports from the regression. The results remained largely unchanged.

17 We are less concerned about the impact of FDI on institutional quality (as stressed by Bénassy-Quéré et al. 2007), as our dependent variable is FDI flows as opposed to stocks.

18 Bénassy-Quéré et al. (2005) explore the impact of various tax schemes on FDI.

19 The FTA dates are based on when the agreement was implemented, as opposed to being signed.

**Table 7**  
**Established trade agreements between emerging Asia from 1990 to 2005<sup>a</sup>**

RTAs	BTAs
AFTA (ASEAN Free Trade Area, 1992, 1993)	India–Sri Lanka (1998, 2000)
SAPTA (SAARC Preferential Trading Arrangement, 1993, 1995)	China–Hong Kong SAR (2003, 2004)
PICTA (Pacific Island Countries Trade Agreement, 2001, 2001)	China–Thailand (2004, 2004)
	India–Thailand (2004, 2004)
	India–Singapore (2005, 2006)
	Pakistan–Sri Lanka (2005, 2005)

<sup>a</sup> The first year in the brackets is the year when the FTA was signed; the second year is the year that the FTA came into force.

Source: World Trade Organisation.

RTAs, regional trade agreements; BTAs, bilateral trade agreements; FTA; free trade agreement.

consumers. Real GDP and real GDP per capita in constant 2000 US dollars were taken from the World Bank's *World Development Indicators* database. Data on exports from the source to the host countries were taken from the IMF's Direction of Trade and Statistics database.<sup>20</sup> We also deflated the export data by the 1996 US CPI for urban consumers. Data on distance and common official language were taken from the CEPII.<sup>21</sup> As noted, the Political Risk Index is from the ICRG database. Data on the ratio of stock market capitalisation to GDP is also from the World Bank's *World Development Indicators* database. The source of average corporate tax rates is a combination of the World Tax Database created by the Office of Tax Policy Research (OTPR) at the University of Michigan Business School and KPMG's Corporate Tax Survey.<sup>22</sup> The data on FTAs was constructed from the World Trade Organisation's website. For financial openness, we used the well-known index developed by Chinn and Ito (2002).<sup>23</sup>

The data analysed is an unbalanced panel of annual data on 14 source countries and 10

host countries between 1990 and 2005. The dataset has a large number of missing observations and a very small number of divestment figures—approximately 48 observations (shown in the data as negative). A missing observation for bilateral FDI may indicate either 'unreported FDI', reflecting the fact that the two countries have chosen to report low FDI values as zero, or 'no FDI', indicating no FDI flows between the two. After a thorough perusal of the data, we feel that most of missing observations were because of 'no FDI'. As for the negative divestment figures, we treated them as zero observations, as they represent no investment in the destination countries.

In all regression estimations we deal with the issue of censored data. One commonly used approach to dealing with censored data is to run a Tobit model (for instance, see Bénassy-Quéré et al. 2007; Stein and Daude 2007; Loungani et al. 2002).<sup>24</sup> We follow di Giovanni (2005) by computing a Tobit model using the two-step procedure. First, a probit model is estimated for whether a deal is observed or not, conditional

20 The data are limited to merchandise trade only.

21 For more information, see CEPII's website at <http://www.cepii.fr/>.

22 The corporate tax rates in OTPR's tax database refer only to the top marginal tax rate on corporations, while the KPMG Tax Survey data refer to top marginal tax rates and other local taxes that burden a foreign corporation. OTPR's tax database extends only to 2002, while KPMG's goes all the way to 2005. However, OTPR has a longer history extending back to 1990, while KPMG's begins at 1993. We used the KPMG data as our starting point and filled in the missing data by comparing tax rates for each country in the sample.

23 The financial openness index is based on the four binary dummy variables, viz., does the country have multiple exchange rates, current account restrictions, capital account restrictions and requirements for the surrender of export proceeds (as reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions).

24 Another option suggested by Santos Silva and Tenreiro (2006) is to use the Poisson pseudo-maximum likelihood method. This technique has recently been applied to FDI by Head and Ries (2008). Coe et al. (2007) suggest another log-linear estimation method to deal with this problem.

on the same right-hand variables as in Equation 1, and the inverse Mills ratio is constructed from the predicted values of the model. Second, a regression is run to estimate Equation 1, including the inverse Mills ratio as a regressor.<sup>25</sup>

**Empirical results**

We considered four initial specifications, each building on the previous one (Table 8). We

began with a basic gravity model without additional explanatory variables in Regression 1. We then add the real sector explanatory variables in Regression 2, the financial variables in Regression 3, and the institutional quality variables and other variables (corporate tax rates and bilateral FTA) in Regression 4.

In the four specifications, the distance variable remains statistically and economically significant. Greater distance between the host and

**Table 8**  
**Gravity equation<sup>a</sup>**

Dependent variable: ln of bilateral real FDI outflows	Regression 1	Regression 2	Regression 3	Regression 4
ln(real GDP <i>i</i> )	2.722*** (0.953)	2.172*** (0.940)	2.246** (0.941)	1.956** (0.932)
ln(real GDP <i>j</i> )	3.087*** (0.690)	2.334*** (0.692)	1.670** (0.729)	2.929*** (0.718)
Common language	0.245 (0.254)	0.235 (0.247)	0.204 (0.245)	0.129 (0.242)
ln distance	-0.809*** (0.137)	-0.447*** (0.164)	-0.445*** (0.164)	-0.354** (0.157)
Difference in real GDP per capita of <i>i</i> and <i>j</i>		0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Lag ln real export of goods from <i>i</i> to <i>j</i>		0.421*** (0.096)	0.417*** (0.098)	0.315*** (0.105)
Change in real exchange rate of <i>i</i> to <i>j</i>		-0.039*** (0.011)	-0.036*** (0.010)	-0.036*** (0.011)
Stock market capitalisation to GDP in <i>j</i>			0.004** (0.002)	0.004** (0.002)
Financial openness in <i>j</i>			0.325** (0.134)	0.387** (0.158)
Corporate tax in <i>j</i>				-0.094* (0.049)
Political risk in <i>j</i>				0.046* (0.026)
Legal origin of UK in <i>j</i>				20.833*** (4.310)
Free trade agreement between <i>i</i> and <i>j</i>				0.680*** (0.253)
Observations	676	673	673	673
Adjusted R <sup>2</sup>	0.72	0.74	0.74	0.74

\* Significant at 10 per cent; \*\* significant at 5 per cent; \*\*\* significant at 1 per cent.

<sup>a</sup> Robust standard error in parentheses. Year dummies, host/source country dummies, inverse Mills' ratio, and constant are not shown.

Source: Authors' calculation.

FDI, foreign direct investment.

25 The standard errors are corrected for heteroscedasticity and we use an estimated parameter of an exogenous variable (the inverse Mills ratio) in the second stage. See di Giovanni (2005) for details.

source countries tends to lower bilateral FDI. As expected, larger countries receive (and send) larger volumes of FDI. A common language is also positively associated with more FDI inflows, although the coefficient is not statistically significant. This may be partly reflective of the fact that the English language dominates economic transactions, especially within Asia.

Regression 2 highlights that the differences in GDP per capita between host and source countries is positive and statistically significant, implying that the greater the degree of income divergence between the countries, the more likely there is to be bilateral FDI flows between them. While this may be indicative of FDI inflows being more horizontal than vertical in nature, the estimated coefficient is effectively zero, suggesting little economic significance of this variable. A 1 per cent increase in lagged exports from the source economy to the host economy is associated with 0.3–0.4 per cent rise in FDI flows, suggesting a degree of complementarity between exports and FDI flows. This may indicate that exporting to a country first leads to greater market familiarity, which in turn facilitates greater FDI flows to that country. A 1 per cent real exchange rate appreciation of the source country *vis-à-vis* the host country is associated with roughly a 3.6–4.0 per cent rise in FDI flows from source to host.<sup>26</sup> Both results are robust across the regressions.

Regression 3 includes the financial market variables. The effect of stock market capitalisation in the host country is positive and statistically significant. A 1 per cent increase in the ratio of market capitalisation to GDP in the host country is associated with a 0.4 per cent increase in FDI inflows. We also tested for the impact of financial openness by including the Chinn–Ito index. We find that a host country that is more financially open attracts more regional FDI flows. However, this result should be interpreted with some caution because of the limitation of the proxy used. In particular, the index may be too aggregated

(that is, an economy may be financially closed to capital flows in general, but what matters is openness to FDI). In addition, the index only captures *de jure* as opposed to *de facto* controls, and, as is well known, controls tend to be leaky when there are sufficient incentives for agents to circumvent them.

Regression 4 adds the institutional quality variables and other variables: the corporate tax rates of the host country and bilateral FTA between the two countries. The political risk index has the correct sign, that is, lower political risk (proxied by a higher ICRG rating) in the source country leads to more FDI inflows. The effects are economically and statistically significant. Lower political risk of the host country is also associated with greater FDI inflows. When the host country adopts a similar legal system to the British common law system, it appears to encourage FDI inflows. The finding concurs with a growing body of literature that suggests that Anglo-American law (that is, common law) improves the quantity of finance and the efficiency with which it is utilised.<sup>27</sup> The presence of an operational FTA also facilitates FDI flows between the source and host countries. We find that if two countries have an operational FTA, then bilateral FDI flows between them will be increased by roughly 68 per cent. This result is also robust. The corporate tax rate has a negative sign and is statistically significant, implying that a lowering of the corporate tax rate in the host country is associated with a rise in FDI inflows. However, this result must be treated cautiously, as we have not controlled for double taxation agreements, tax-sparing agreements, tax incentives, transfer pricing, etc., all of which may muddy the results.

### Robustness check

We performed a number of sensitivity analyses to ascertain the robustness of these results (Table 9). In Regression 5, we added a dummy variable to show that post-1997, Mainland China and Hong Kong SAR are one country.

26 The finding is aligned with works by Cushman (1985), Froot and Stein (1991), Blonigen (1997), and others.

27 These results broadly concur with those of Beck et al. (2004) who find that a country's legal origin influences its firms' access to foreign finance.

**Table 9**  
**Robustness checks<sup>a</sup>**

Dependent variable: ln of bilateral real FDI outflows	Regression 5	Regression 6	Regression 7	Regression 8	Regression 9
Robustness test	With HKG is CHN in post-1997	With same country: CHN–HKG, HKG–CHN, TWN–CHN	Divestment in <i>i</i> to <i>j</i> becomes investment in <i>j</i> to <i>i</i>	Dropping all the missing variable	Dependent variable as ln(1 + FDI)
Econometric methodology	Two-stage tobit	Two-stage tobit	Two-stage tobit	Pooled OLS	Pooled OLS
ln(real GDP <i>i</i> )	1.831** (0.921)	1.347 (0.905)	0.939** (0.932)	0.676* (0.888)	1.209** (0.540)
ln(real GDP <i>j</i> )	2.466*** (0.741)	1.998*** (0.713)	2.913*** (0.720)	2.977** (0.721)	0.481 (0.665)
Common language	0.116 (0.242)	–0.061 (0.232)	0.131 (0.242)	0.121 (0.243)	0.692*** (0.164)
ln distance	–0.456*** (0.161)	–0.290* (0.149)	–0.358** (0.158)	–0.392** (0.158)	–0.177 (0.117)
Difference in real GDP per capita of <i>i</i> and <i>j</i>	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)
Lag ln real export of goods from <i>i</i> to <i>j</i>	0.264** (0.105)	0.105*** (0.089)	0.315*** (0.105)	0.282*** (0.106)	0.212*** (0.082)
Change in real exchange rate of <i>i</i> to <i>j</i>	–0.038*** (0.011)	–0.038*** (0.011)	–0.036*** (0.011)	–0.040*** (0.013)	–0.027*** (0.010)
Stock market capitalisation to GDP in <i>j</i>	0.003* (0.002)	0.004** (0.002)	0.004*** (0.002)	0.003 (0.002)	0.007*** (0.001)
Financial openness in <i>j</i>	0.382** (0.158)	0.392** (0.160)	0.380** (0.158)	0.428*** (0.158)	0.066 (0.104)
Corporate tax in <i>j</i>	–0.089* (0.049)	–0.097** (0.047)	–0.093* (0.049)	–0.070 (0.047)	–0.049 (0.030)
Political risk in <i>j</i>	0.038 (0.026)	0.036 (0.025)	0.047* (0.026)	0.026 (0.023)	0.042*** (0.014)
Legal origin of UK in <i>j</i>	17.928*** (4.439)	14.941*** (4.270)	20.736*** (4.317)	20.512*** (4.337)	1.058** (0.528)
Free trade agreement between <i>i</i> and <i>j</i>	0.196 (0.270)	–0.704** (0.329)	0.683*** (0.254)	0.621*** (0.251)	0.883*** (0.230)
Same country <sup>b</sup>		3.197*** (0.469)			
Hong Kong post-1997	2,014*** (0.517)				
Observations	673	673	673	673	1,292
Adjusted R <sup>2</sup>	0.75	0.76	0.74	0.74	0.54

\* Significant at 10 per cent; \*\* significant at 5 per cent; \*\*\* significant at 1 per cent.

<sup>a</sup> Robust standard error in parentheses. Year dummies, host/source country dummies, inverse Mills' ratio, and constant are not shown.

<sup>b</sup> Same country is a dummy variable for country-pair China–Hong Kong SAE and China–Taiwan POC.

Source: Authors' calculation.

FDI, foreign direct investment; CHN, China; HKG, Hong Kong; TWN, Taiwan.

In this way, investment flows between Mainland China and Hong Kong SAR are treated differently in the pre-1997 and post-1997 periods. In Regression 6, we take Greater China to be a single sovereign entity (that is, we view Mainland China, Hong Kong SAR and Taiwan POC as parts of the one country). In Regression 7, we added the divestments from source country to host country to the investment flow from host country to source country. In Regression 8, we dropped all divestments and missing and zero observations and re-ran a simple ordinary least squares (OLS) pooled regression. In Regression 9, we converted all missing and negative observations to zero, expressed the dependent variable as  $\ln(1 + FDI)$ , similar to Eichengreen and Irwin (1998), and estimated it as an OLS regression.<sup>28</sup>

Regression 5 results are almost identical to those of the baseline Regression 4. The one exception is that the FTA dummy now becomes insignificant, while the 'same country' dummy becomes significant and positive.<sup>29</sup> In Regression 6, once again the 'same country' dummy (Greater China) is significant and positive, while the FTA dummy becomes insignificant. Everything else broadly remains unchanged.<sup>30</sup> In Regression 7, when we add the divestment from country  $i$  to country  $j$  to investment flows from country  $j$  to country  $i$ , the results are virtually identical to the baseline Regression 4. In the last two robustness checks, Regressions 8 and 9, the explanatory variables broadly have the same signs as in the baseline regression, although their economic and statistical significances differ from the baseline Tobit models. This is likely because of the drawback of using simple OLS regression and dropping zero and missing FDI observations, Regression 8, or using  $\ln(1 + FDI)$ , Regression 9, both of which are rather *ad hoc*. By and large, therefore, it appears that the results are highly robust.

## Concluding Remarks

The paper has investigated trends and drivers of intra-Asian FDI flows, using bilateral FDI flows involving 14 developing Asian countries for the period 1990–2005. The data indicates that around 35 per cent of FDI flows to developing Asia between 1990 and 2005 came from within the region, with over 90 per cent of the flows originating from Hong Kong SAR, Mainland China, Singapore and Taiwan POC. Clearly, some of these flows are overstated, as they involve recycling or round-tripping of funds (especially between Mainland China and Hong Kong SAR). Against this, trans-shipping from offshore financial centers has not been included.<sup>31</sup>

The data do not indicate that intra-Asian flows are intensifying. Given that developing Asia is investing aggressively overseas, this suggests that relatively more investments are being made outside developing Asia.

An augmented gravity model fits the data fairly well. The baseline OLS regression is able to capture much of the variation in intra-Asian FDI flows. Most of the estimated coefficients have the correct signs and are statistically and economically significant. Intra-regional FDI activity between emerging Asian economies is driven by economic factors such as market size (especially the host country), export intensity, real exchange rate changes, financial depth, institutional factors (such as political risk and origin of legal system), an operational FTA, and the level of financial openness of the host country. As in the case of international trade, distance stands out as an important determinant of bilateral FDI flows, even after the inclusion of bilateral FTA, suggesting that transport costs and informational asymmetries are factors that could hinder FDI flows.

28 Thus Regression 9 has almost double the observations of the other regressions.

29 Mainland China and Hong Kong SAR signed an FTA in 2003–04, which is captured in the FTA dummy.

30 The only other difference between Regression 6 and the baseline regression Regression 4 is that the common language variable becomes negative, although is statistically insignificant in both cases.

31 See UNCTAD (2006:12–3) for a brief discussion of round-tripping and trans-shipping in the context of cross-border FDI flows.

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## Appendix 1

**Table A1**  
**Variables Included in the Dataset**

Variables	Source
FDI Inflows	UNCTAD FDI/TNC database
Real GDP in US dollar	World Development Indicators, World Bank
Real GDP per capita in US dollar	World Development Indicators, World Bank
Consumer price indices	International Financial Statistics, IMF
Exports of goods	Direction of Trade Statistics, IMF
Nominal Bilateral Exchange Rate	International Financial Statistics, IMF
Market capitalization of listed companies	World Development Indicators, World Bank
Distance	CEPII
Common Official Language	CEPII
Political risk	ICRG
Corporate tax rate	KPMG Indirect and Corporate Tax Survey, and OTPR's World Tax Database
Trade agreements	WTO website
Financial Openness	Menzie Chin and Hiro Ito Index
Bilateral telephon traffic flow	International Telecommunication Union and Telegeography Inc.
Telephone densities	World Development Indicators
Total telephone subscribers	World Development Indicators

**Table A2**  
**Source and Host Economies in the Dataset**

Source	Host
Bangladesh	Bangladesh
China (Mainland)	China (Mainland)
Hong Kong, SAR	Hong Kong, SAR
India	India
Indonesia	Korea
Korea	Malaysia
Malaysia	Pakistan
Pakistan	Philippines
Philippines	Singapore
Singapore	Thailand
Sri Lanka	
Taiwan, POC	
Thailand	
Vietnam	

**Table A3**  
**Summary of Statistics**

Variable	Units	Observation	Mean	Std. Dev.	Min	Max
Bilateral FDI flows from i to j	US\$ millions	724	568.6	2,508.4	-1,274.8	20,677.0
Real GDP country i	US\$ billions	1,296	238.1	295.0	9.8	1,889.9
Real GDP country j	US\$ billions	1,296	244.8	380.5	29.5	1,889.9
Real GDP per capita country i	US\$	1,296	7,404.4	8,747.6	226.9	30,009.6
Real GDP per capita country j	US\$	1,296	6,361.5	8,819.9	283.3	30,009.6
Common official language	Dummy, 1 = yes 0 = no	1,296	0.3	0.5	0.0	1.0
Distance	Kilometres	1,296	2,783.5	1,260.1	315.5	5,220.9
Lag exports from i to j	US\$ millions	1,294	3,504.3	9,322.1	0.0	114,180.4
Bilateral nominal exchange rate of i w.r.t j	Nominal	1,296	4.5	15.6	0.0	180.9
Average consumer price indices of i per year	Index with 2000 = 100	1,296	88.9	22.1	23.9	155.9
Average consumer price indices of j per year	Index with 2000 = 100	1,296	89.6	18.5	41.9	129.8
Average US consumer price index for urban consumer per year	Index with 1996 = 100	1,296	103.5	14.5	83.3	128.5
Lag of market capitalization of listed companies in i	Percent of GDP	1,296	82.2	96.2	0.0	519.5
Market capitalization of listed companies in j	Percent of GDP	1,296	96.8	105.0	0.0	566.0
Average corporate tax in i	Percent	1,296	31.3	7.2	16.0	55.0
Political risk index in i	100 = min 0 = max	1,296	66.6	12.3	29.3	89.1
Legal origin British common law system	Dummy, 1 = yes 0 = no	1,296	0.6	0.5	0.0	1.0
Free trade agreements	Dummy, 1 = yes 0 = no	1,296	0.2	0.4	0.0	1.0
Bilateral telephone traffic flow	Millions of minutes	1,296	49.9	171.1	0.0	2,278.8
Capital Openness Index	1.06 = min, 2.62 = max	1,296	0.3	1.5	-1.8	2.6