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HONG KONG, SINGAPORE AND THE EAST ASIAN CRISIS: A FIRST LOOK AT THE IMPORTANCE OF TRADE SPILLOVERS

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Abstract

The literature on the East Asian crisis has concentrated almost exclusively on the five crisis-hit economies of Indonesia, Korea, Malaysia, Thailand and the Philippines (Asia-5). Relatively scant attention has been paid to Hong Kong and Singapore, both of which also suffered from contagious fallout from the crisis despite being well acknowledged as having relatively sound financial and economic fundamentals. This paper examines the extent to which trade spillovers, both direct and indirect, have been important in transmitting the regional downturn from the Asia-5 economies to Hong Kong and Singapore.

1. Introduction

In the context of international finance, "contagion" has come to be referred to as the simultaneous occurrence of currency crises in two or more economies. It may be more formally defined as a situation where a currency crisis in one economy leads to a jump to a "bad" equilibrium in a neighbouring economy (Masson, 1998)[1]. By "currency crisis" we mean an actual break of an exchange rate peg and concomitant currency depreciation, or speculative pressure that may not necessarily lead to an exchange rate depreciation, but does lead to a depletion of foreign exchange reserves or an interest rate hike, with consequent adverse effects on growth.

While contagion could take on a *global* dimension[2], there is a growing body of literature confirming its *regional* dimension. For instance, in a recent study using a sample of 20 countries covering the periods of the 1982 Mexican debt crisis, the 1994-95 Tequila crisis and the 1997-98 East Asian crisis, De Gregario and Valdes (1999) found contagion to be directly dependent on geographical horizon. Using a panel of annual data for 19 developing economies for the period 1977-93, Krueger et al. (1998) concluded that a currency crisis in a regional economy raises the probability of a speculative attack on the domestic currency by about 8.5 percent points[3].

In the case of East Asia, while the initial stage of the crisis (July to August 1997) occurred as the devaluation of the Thai baht spread to the weaker Southeast Asian economies of Indonesia, Philippines and Malaysia, the second stage of the crisis (October

[1] Contagion is also sometimes used to denote an increase in asset price volatility across countries.

[2] A good instance of this was the across-the-board rise in emerging market risk premia and bond spreads following the Russian sovereign debt default in August 1998. Similarly, during the Tequila crisis, the currencies of Thailand, Hong Kong and the Philippines experienced brief periods of speculative attacks.

[3] Other recent empirical studies confirming this regional dimension of currency crises include Calvo and Reinhart (1996), Frankel and Schmukler (1996) and Glick and Rose (1999). Kaminsky and

to December 1997) impacted the higher income economies, viz. Taiwan, South Korea and the two city states of Hong Kong and Singapore. Notwithstanding some concerns about longer term growth sustainability due to low total factor productivity growth, especially in Singapore (Krugman, 1994 and Young, 1995), it was generally acknowledged that these two city states had among the strongest macroeconomic fundamentals (Table 1) and most robust financial systems in region, and emerging economies as a whole. Yet they did suffer from the regional crisis.

Table 1
Hong Kong and Singapore: Selected Macroeconomic Indicators

Hong Kong	1990-95 (Ann. Ave.)	1996	1997	1998	1999
Real GDP growth	4.9	4.5	5.0	-5.1	3.0
Inflation rate	9.1	6.3	5.8	2.8	-4.0
Fiscal balance (US$ mn.)	1618	n.a	n.a	n.a	n.a
Current a/c balance (US$ mn.)	n.a	n.a	n.a	2901	9281
Investment ratio[a]	29.6	32.1	n.a	n.a	n.a
Savings rate	33.7	31.1	n.a	n.a	n.a
Export growth	15.57	4.03	4.04	-7.48	-0.06
Import growth	17.86	3.01	5.07	-11.55	-2.71
Trade to GDP ratio	2.39	2.46	2.32	2.19	2.23
Domestic Exports to GDP ratio	0.29	0.18	0.16	0.15	0.14
Unemployment rate	2.0	2.8	2.2	4.7	n.a.
External debt to exports	n.a	n.a	n.a	n.a	n.a
Reserves to Imports	7.3	5.6	5.9	7.5	18.2
Exchange rate (HK$ $ /US $)	7.752	7.730	7.740	7.750	7.760
Singapore	1990-95 (Ann. Ave.)	1996	1997	1998	1999
Real GDP growth	9.0	7.5	8.4	0.4	5.4
Inflation rate	2.7	1.4	2.0	-0.3	0.0
Fiscal balance (US$ mn.)	10930	18868	13612	23163	14577
Current a/c balance (US$ mn.)	7327	13898	16912	21025	21254
Investment ratio[a]	35.53	36.8	39.3	32.8	32.8
Savings rate[a]	48.37	50.1	52.2	52.4	51.7
Export growth[b]	10.6	5.2	5.3	-1.0	5.8
Import growth[b]	11.7	5.0	6.2	-13.6	10.8
Trade to GDP ratio	2.88	2.81	2.72	2.55	2.66
Domestic Exports to GDP ratio	0.86	0.80	0.77	0.76	0.81
Unemployment rate	2.4	3.0	2.4	3.2	n.a.
External debt to exports	n.a	n.a	n.a	n.a	n.a
Reserves to Imports	52.5	58.2	60.8	73.4	68.3
Exchange rate (S $ /US $)	1.62	1.41	1.48	1.67	1.69

Sources: IMF, *International Financial Statistics Yearbook*, various issues and Department of Statistics, Republic of Singapore, *Yearbook of Statistics*, various issues

The Singapore dollar depreciated by about 15 percent relative to the US dollar between July 1997 to March 1999, reversing a persistently appreciating trend over the period prior to the crisis (Chart 1). While Hong Kong's exchange rate remained constant relative to the US dollar, being pegged via a currency board arrangement, this was only managed by a sharp hike in interest rates to counter periods of intense speculative attacks

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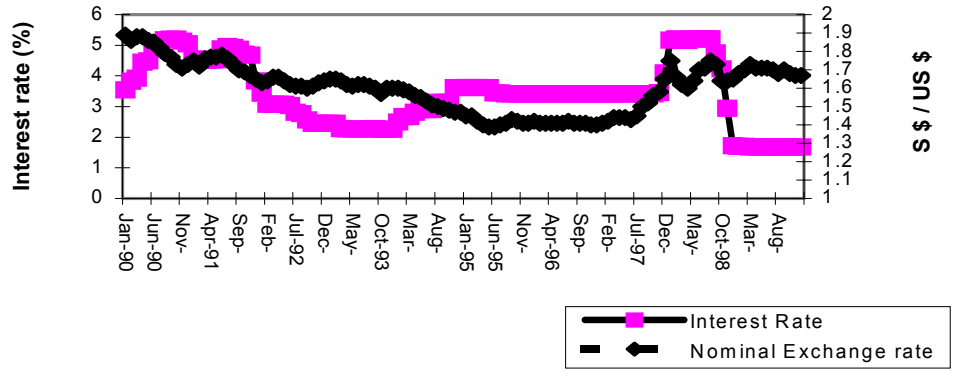
Reinhart (2000) find that vulnerability to contagion is highly "nonlinear", with the probability of a

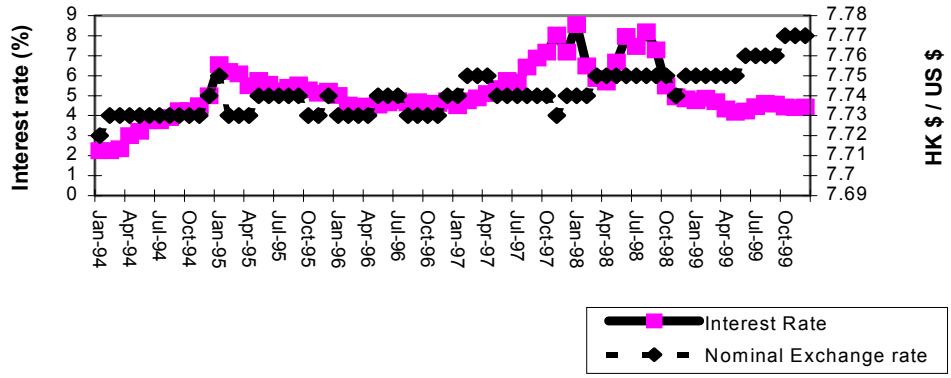
(Chart 2). The inevitable result was a deep recession, with Hong Kong's overall GDP declining by 5 percent in 1998 compared to an average annual growth of about 5 percent during the first half of the 1990s. In Singapore's case, while timely albeit draconian government policies helped cushion the negative shock of the regional crisis (Ngiam, 2000), growth did nevertheless stagnate in 1998 (0.4 percent), a sharp contrast to the annual average growth of 9 percent in the first half of the 1990s (Table 1).

Chart 1
Singapore: Nominal Exchange Rate and Interest Rate



Note: Interest rates refer to the 3- month deposit rate
Source : IMF, International Financial Statistics, and various issues

Chart 2
Hong Kong: Nominal Exchange Rate and Interest Rate



Note: Interest rates refer to the 3- month deposit rate
Source: IMF, International Financial Statistics, and various issues

domestic crisis rising sharply if a group of economies in the region are already in crisis.

A distinction needs to be made between transmission channels that are related to investor sentiment or psychology (termed "pure contagion") and linkages between economies that are measurable/observable *ex-ante* (referred to as "spillovers" or "fundamentals-based contagion")[4]. Recognising that both Hong Kong and Singapore are small and open economies and are important regional re-export centres with strong regional trade (and investment) links[5], our focus in this paper is on trade spillovers, i.e. fundamental-based contagion through trade linkages. Indeed, both economies suffered sharp declines in export revenues (in US dollar terms) in 1998 (Table 2). The emphasis on the trade channel is also consistent with Glick and Rose (1999) who have noted that:

> trade is an important channel for contagion, above and beyond macroeconomic influences. Countries who trade and compete with the target of speculative attacks are themselves likely to be attacked…This linkage is intuitive, statistically robust, and important in understanding the regional nature of speculative attacks (pp. 604-5)[6].

Table 2

Changes in East Asian Exports, 1971-98 (percent)

	1971-80	1981-90	1991-95	1996-98	1995	1996	1997	1998
Dollar revenues								
Hong Kong	22.2	15.2	15.7	0.2	14.0	5.3	3.3	-7.9
Indonesia	39.6	2.1	12.3	2.9	14.3	10.4	2.4	-4.1
Korea	34.2	14.1	15.2	2.2	31.6	4.0	7.5	-5.0
Malaysia	25.3	9.5	20.7	0.6	25.8	9.6	1.6	-9.3
Philippines	19.6	5.2	17.4	3.0	24.3	15.5	9.1	-15.7
Singapore	30.1	12.1	16.7	-4.1	22.6	5.2	0.2	-17.6
Thailand	22.9	14.9	19.3	-1.9	25.3	1.5	1.6	-8.9
Real volumes								
Hong Kong	9.7	3.6	13.4	2.0	11.0	5.5	5.1	-4.6
Indonesia	9.5	1.5	11.1	6.2	7.9	8.2	7.8	2.5
Korea	21.4	11.2	14.9	16.6	24.0	13.0	23.6	13.3
Malaysia	8.1	11.0	15.5	6.7	17.6	7.2	10.8	2.0
Philippines	10.3	4.0	9.5	12.6	12.0	8.6	20.9	8.3
Singapore	16.1	11.3	13.1	2.4	14.9	5.6	6.9	-5.3
Thailand	9.9	14.1	14.3	2.9	15.5	-1.8	6.6	3.9
Dollar prices								
Hong Kong	11.5	1.3	2.1	-1.8	2.7	-0.2	-1.7	-3.5
Indonesia	27.5	1.3	1.2	-3.1	6.0	2.0	-5.0	-6.4
Korea	10.8	2.5	0.1	-10.2	6.1	-6.0	-8.0	-16.5
Malaysia	15.2	-1.5	4.6	-5.7	7.0	2.3	-8.3	-11.1
Philippines	9.6	1.4	7.2	-8.6	11.0	4.0	-7.8	-22.0
Singapore	7.8	0.6	3.2	-2.4	6.7	-0.4	6.3	-13.0
Thailand	12.4	0.5	4.4	-4.6	8.5	3.4	-4.7	-12.3

Note: Data refer to national income account exports of goods and nonfactor services. Philippines data for 1996-98 are for goods only

Source: World Bank (2000)

[4] A third category, "common external shocks" or "monsoonal effects", refers to all those factors that impact all regional economies (Masson, 1998). A number of external shocks have been suggested in the case of the East Asian crisis (Whitt, 1999).

[5] Singapore and Hong Kong have the highest trade to GDP ratios in the world, leading Krugman (1995) to refer to them as "super traders".

[6] Also see van Rijckeghem and Weder (1999). In a pioneering study, Eichengreen et al. (1996) emphasised this channel for industrial countries.

Trade spillovers in turn could either be due to “complementarity” or “competition” in export product structures between regional economies. With regard to the former (“direct channel”), there may exist extensive intraregional trade and investment linkages which could lead to contagion due to trade complementarities. For instance, on the one hand, currency devaluation in an emerging economy is often accompanied by a sharp economic downturn (van Wijnbergen, 1986), thereby compressing imports. This in turn reduces exports of its trading partners, consequently leading to “demand-driven” trade spillovers. On the other hand, there may be extensive and growing trade, investment and other intraregional interdependencies leading to contagion due to trade complementarities that are “supply-driven”, i.e. “indirect channel”. For instance, it is commonly noted that Japanese foreign direct investment (FDI) has developed an intricate division of labor based on both horizontal and vertical differentiation in East Asia (Kawai and Urata, 1998). This in turn has stimulated intraregional trade which has constituted roughly two-fifths of the regions’ total trade, with parts and components playing a particularly important role in such transactions (World Bank, 2000).

In contrast to the complementary-induced channels, even economies that do not have strong trade and investment linkages with the crisis-hit economies may still be indirectly impacted if their exports to third markets overlap significantly. In other words, currency devaluation in one economy may provoke devaluation in a trade competitor (i.e. another economy with similar export structures/comparative advantage) that suddenly finds itself in a competitive disadvantage (Gerlach and Smets, 1995, Huh and Kasa, 1997 and Corsetti, et al., 1999).

The aim of this paper is to ascertain the importance of trade spillovers in spreading the regional downturn from the crisis-affected economies, viz. Indonesia, Malaysia, Thailand, Philippines, and Korea (henceforth referred to as the Asia-5 economies), to Hong Kong and Singapore. The layout of the remainder of this paper is as follows. Section 2

focuses on trade complementarities, examining Hong Kong's and Singapore's trade and investment linkages with the Asia-5 economies. Section 3 turns its attention to the competitiveness-driven trade spillover channel, investigating the degree of similarity of comparative advantage and export structures of the regional economies. The final section provides a summary by way of concluding.

2. Spillovers due to Trade Complementarity

2.1 Data Preliminaries

Since Hong Kong and Singapore are both engaged in a significant amount of entrêpot trade, a distinction needs to be made between "re-exports" and "domestic exports"[7]. If the commodity is produced, processed, transformed or assembled in the country, it is referred to as domestic exports. However if the commodity is exported from the country in the same form as it has been imported, i.e. with little or no transformation (i.e. negligible value added), it is referred to as re-exports. Failure to clearly distinguish between these two components of exports could potentially distort aggregate trade figures.

Trading partners of entrêpot economies that have a high share of domestic exports in total exports tend to report relatively consistent data at the bilateral level (i.e. within the mark-up level of 10 percent between imports reported *c.i.f.* and exports reported *f.o.b.*). The potential for discrepancy lies more with other trading partners which engages in high levels of re-export transactions. This is so, as there is often a difference in assigning these re-exports by the importing country as coming from the country of origin, which is not the original country from where the goods are exported, especially when they are trans-shipped through another country. For instance, bilateral trade balances reported by Singapore with some of its trading partners are of completely different signs than what internationally consistent data sources would suggest. More specifically, Singapore data consistently show it to have fairly large trade surpluses with its trading partners, mainly due to inclusion

[7] In 1999, the share of re-exports in Hong Kong's total exports was 87 percent, while that of Singapore was 40 percent.

of its re-exports, unlike trade data available via multilateral sources, which consider only exports with value-added (Sen, 2000). Broadly similar problems arise with Hong Kong's trade data, given the large-scale transit trade with Mainland China (Feenstra, et al., 1998).

Nonetheless, since conventional internationally comparable data sources of bilateral trade data such as the *Direction of Trade Statistics* published by the IMF do not distinguish between re-exports and domestic exports, where possible, we have had to make use of data on *Singapore's Trade Statistics* published by the Trade Development Board of Singapore and the *Annual Review of Hong Kong External Trade* put out by the Census and Statistics Department of Hong Kong, along with international data sources[8]. While we would ideally like to examine both trade in goods as well as services, severe data limitations on services trade limit the focus to manufactured goods.

2.2 Trade Linkages

Tables 3 and 4 respectively convey information on the trends in Hong Kong's and Singapore's bilateral trade with the Asia-5 economies. There are several points worth noting.

Almost 80 percent or more of Hong Kong's total exports to the Asia-5 economies consisted of re-exports in 1999, while the corresponding figure for Singapore has hovered between 40 and 50 percent. Trends in Hong Kong's exports are therefore almost entirely reflective of the trends in re-exports, which include goods being trans-shipped from China and Taiwan through Hong Kong. Importantly, while the shares of re-exports in Hong Kong's total exports to the Asia-5 economies have either been more or less constant or declined, the shares of re-exports in Singapore's total exports to the region have been increasing over time.

[8] Our analysis does not include Singapore's trade with Indonesia, as the former has chosen not to publish its bilateral trade statistics with Indonesia since 1963

Table 3

Trends in Hong Kong's Trade with the Asia-5 Economies and Singapore (1991-99) (US$ millions)

Malaysia

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Share in Re-exports in Total exports
1991	1269		1.27	292		0.98	418		0.61	711		0.72	58.87
1992	1657	30.6	1.34	323	10.5	1.07	509	21.8	0.57	832	17.1	0.70	61.20
1993	2050	23.7	1.48	332	2.8	1.15	569	11.7	0.53	901	8.3	0.67	63.15
1994	2607	27.2	1.61	364	9.6	1.27	792	39.1	0.63	1156	28.2	0.75	68.50
1995	3723	42.8	1.93	335	-8.0	1.12	1212	53.1	0.84	1547	33.8	0.89	78.35
1996	4395	18.1	2.21	323	-3.4	1.18	1370	13.1	0.89	1694	9.5	0.94	80.90
1997	4909	11.7	2.35	347	7.1	1.27	1374	0.3	0.85	1721	1.6	0.91	79.86
1998	4193	-14.6	2.27	235	-32.2	0.97	1128	-17.9	0.75	1363	-20.8	0.78	82.75
1999	3868	-7.8	2.15	251	6.6	1.14	1165	3.3	0.77	1416	3.9	0.81	82.29

Indonesia

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Share in Re-exports in Total exports
1991	700		0.70	131		0.44	574		0.83	705		0.72	81.43
1992	853	21.9	0.69	137	4.6	0.45	597	4.0	0.67	734	4.1	0.61	81.35
1993	920	7.9	0.66	168	22.7	0.58	677	13.3	0.64	845	15.1	0.62	80.11
1994	1265	37.4	0.78	162	-3.5	0.56	758	12.1	0.60	921	9.0	0.59	82.39
1995	1633	29.1	0.85	206	27.2	0.69	856	12.8	0.60	1062	15.3	0.61	80.58
1996	1631	-0.1	0.82	202	-2.2	0.73	805	-6.0	0.52	1006	-5.2	0.56	79.97
1997	1669	2.4	0.80	153	-23.9	0.56	764	-5.1	0.48	917	-8.9	0.49	83.27
1998	1812	8.5	0.98	87	-43.1	0.36	433	-43.3	0.29	521	-43.2	0.30	83.24
1999	1533	-15.4	0.85	89	1.8	0.40	684	57.9	0.45	773	48.5	0.44	88.51

Thailand

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Share in Re-exports in Total exports
1991	1323		1.32	270		0.91	803		1.17	1073		1.09	74.83
1992	1526	15.3	1.24	288	6.6	0.95	771	-4.0	0.86	1059	-1.4	0.89	72.81
1993	1682	10.3	1.21	264	-8.1	0.92	756	-1.9	0.71	1021	-3.6	0.75	74.09
1994	2225	32.2	1.37	327	23.5	1.14	964	27.5	0.76	1291	26.4	0.83	74.70
1995	2728	22.6	1.42	346	6.0	1.16	1269	31.7	0.88	1615	25.2	0.93	78.58
1996	3070	12.6	1.55	334	-3.5	1.22	1475	16.2	0.96	1809	12.0	1.00	81.53
1997	3367	9.7	1.61	280	-16.1	1.03	1587	7.6	0.99	1867	3.2	0.99	85.00
1998	2871	-14.8	1.56	206	-26.4	0.85	1266	-20.2	0.85	1473	-21.1	0.85	85.99
1999	2939	2.4	1.64	173	-16.3	0.79	1382	9.1	0.91	1555	5.6	0.89	88.89

Philippines

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Share in Re-exports in Total exports
1991	383		0.38	278		0.93	638		0.93	916		0.93	69.68
1992	447	16.7	0.36	307	10.6	1.02	801	25.5	0.90	1108	20.9	0.93	72.28
1993	518	15.9	0.37	293	-4.7	1.02	1043	30.3	0.98	1336	20.6	0.99	78.10
1994	607	17.3	0.38	377	28.7	1.31	1491	42.9	1.18	1868	39.8	1.21	79.83
1995	862	41.9	0.45	377	0.1	1.26	1632	9.4	1.13	2009	7.6	1.16	81.23
1996	952	10.4	0.48	331	-12.3	1.21	1819	11.5	1.19	2150	7.0	1.19	84.61
1997	1268	33.2	0.61	354	6.9	1.30	1855	2.0	1.15	2209	2.7	1.17	83.98
1998	1323	4.4	0.72	257	-27.3	1.06	1431	-22.9	0.96	1688	-23.6	0.97	84.77
1999	1586	19.9	0.88	286	11.3	1.30	1454	1.6	0.96	1740	3.1	1.00	83.55

Table 3
Trends in Hong Kong's Trade with the Asia-5 Economies and Singapore (1991-99) (US$ millions)

Korea

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Share in Re-exports in Total exports
1991	4497		4.49	228		0.77	1883		2.74	2110		2.14	89.22
1992	5704	26.8	4.62	183	-19.7	0.60	1755	-6.8	1.97	1938	-8.2	1.62	90.57
1993	6234	9.3	4.50	253	38.5	0.88	2009	14.4	1.89	2262	16.7	1.67	88.81
1994	7447	19.5	4.60	273	8.0	0.95	2133	6.2	1.69	2406	6.4	1.55	88.65
1995	9471	27.2	4.91	310	13.4	1.03	2494	16.9	1.73	2804	16.5	1.61	88.95
1996	9478	0.1	4.77	337	8.9	1.23	2598	4.2	1.69	2935	4.7	1.62	88.51
1997	9458	-0.2	4.53	302	-10.4	1.11	2494	-4.0	1.55	2797	-4.7	1.49	89.19
1998	8887	-6.0	4.82	202	-33.3	0.83	1580	-36.6	1.06	1782	-36.3	1.02	88.68
1999	8434	-5.1	4.70	193	-4.2	0.88	2551	61.4	1.68	2745	54.0	1.58	92.96

Singapore

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Amount	Gr.	Share in Hong Kong total	Share in Re-exports in Total exports
1991	4057		4.05	1132		3.81	1556		2.26	2688		2.73	57.90
1992	5050	24.5	4.09	1338	18.3	4.43	1791	15.1	2.01	3130	16.4	2.62	57.24
1993	6184	22.5	4.46	1466	9.6	5.09	2216	23.7	2.08	3683	17.7	2.72	60.18
1994	8018	29.7	4.95	1582	7.9	5.50	2633	18.8	2.09	4214	14.4	2.72	62.47
1995	10086	25.8	5.23	1582	0.0	5.28	3362	27.7	2.34	4944	17.3	2.85	68.01
1996	10537	4.5	5.31	1294	-18.2	4.72	3670	9.2	2.39	4965	0.4	2.75	73.93
1997	10228	-2.9	4.90	1085	-16.1	3.98	3795	3.4	2.36	4881	-1.7	2.60	77.76
1998	7935	-22.4	4.30	659	-39.3	2.71	3308	-12.8	2.21	3967	-18.7	2.28	83.39
1999	7736.1	-2.5	4.3	474.6	-28.0	2.2	3701.5	11.9	2.4	4176.1	5.3	2.4	88.6

Asia 5 Economies plus Singapore

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Combine Share in Hong Kong total	Amount	Gr.	Combined Share in Hong Kong total	Amount	Gr.	Combined Share in Hong Kong total	Amount	Gr.	Combined Share in Hong Kong total	Share of Re-exports in Total exports
1991	100240		12.20	29731		7.84	68824		8.53	98555		8.32	69.83
1992	123414	23.1	12.35	30246	1.7	8.52	89248	29.7	6.97	119494	21.2	7.37	74.69
1993	138658	12.4	12.68	28831	-4.7	9.63	106420	19.2	6.83	135252	13.2	7.43	78.68
1994	161833	16.7	13.70	28737	-0.3	10.73	126148	18.5	6.95	154885	14.5	7.65	81.45
1995	192755	19.1	14.79	29946	4.2	10.54	143807	14.0	7.53	173753	12.2	8.05	82.77
1996	198543	3.0	15.14	27431	-8.4	10.29	153313	6.6	7.66	180744	4.0	8.05	84.82
1997	208612	5.1	14.81	27307	-0.5	9.24	160750	4.9	7.38	188056	4.0	7.65	85.48
1998	184510	-11.6	14.64	24331	-10.9	6.77	149664	-6.9	6.11	173995	-7.5	6.20	86.02
1999	179520	-2.7	14.54	21990	-9.6	6.67	151895	1.5	7.20	173885	-0.1	7.13	87.35

Source : Computed by authors from Census and Statistics Department, Hong Kong, *Annual Review of Hong Kong External Trade*, various issues
Notes: Gr. Indicates Growth over the previous year

Table 4
Trends in Singapore's Trade with Asia-4 Economies and Hong kong (1991-99) (US$ million)

Malaysia

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore 's total	Share of Re-exports in Total exports
1991	10062		15.22	3947		10.33	4872		23.48	8819		14.95	55.2
1992	10612	5.5	14.71	3820	-3.2	9.38	4115	-15.5	18.11	7934	-10.0	12.51	51.9
1993	14030	32.2	16.47	4957	29.8	10.62	5529	34.4	20.27	10485	32.1	14.18	52.7
1994	16760	19.5	16.37	8792	77.4	15.17	10252	85.4	26.64	19044	81.6	19.74	53.8
1995	19250	14.9	15.48	9483	7.9	13.65	13182	28.6	27.06	22665	19.0	19.18	58.2
1996	19721	2.4	15.02	9432	-0.5	12.84	13080	-0.8	25.38	22512	-0.7	18.01	58.1
1997	19900	0.9	15.03	9427	-0.1	13.02	12398	-5.2	23.58	21824	-3.1	17.46	56.8
1998	15686	-21.2	15.45	7553	-19.9	11.93	9177	-26.0	19.73	16730	-23.3	15.24	54.9
1999	17276	10.1	15.56	8278	9.6	12.06	10698	16.6	23.26	18976	13.4	16.55	56.4

Thailand

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore 's total	Share of Re-exports in Total exports N21
1991	2101		3.18	2598		6.80	1107		5.34	3705		6.28	29.89
1992	2680	27.6	3.71	2555	-1.7	6.27	1400	26.4	6.16	3955	6.7	6.23	35.39
1993	3513	31.1	4.12	2460	-3.7	5.27	1751	25.1	6.42	4212	6.5	5.70	41.59
1994	4891	39.2	4.78	2694	9.5	4.65	2665	52.2	6.92	5359	27.3	5.56	49.73
1995	6418	31.2	5.16	3358	24.6	4.83	3466	30.1	7.12	6824	27.3	5.77	50.80
1996	7175	11.8	5.46	3235	-3.7	4.40	3862	11.4	7.49	7096	4.0	5.68	54.42
1997	6789	-5.4	5.13	2722	-15.9	3.76	3025	-21.7	5.75	5746	-19.0	4.60	52.64
1998	4851	-28.5	4.78	2112	-22.4	3.34	2093	-30.8	4.50	4205	-26.8	3.83	49.78
1999	5244	8.1	4.72	2533	20.0	3.69	2503	19.6	5.44	5036	19.8	4.39	49.70

Philippines

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore 's total	Share of Re-exports in Total exports
1991	275		0.42	387		1.01	294		1.42	681		1.15	43.20
1992	317	15.4	0.44	403	4.3	0.99	405	37.8	1.78	808	18.8	1.27	50.11
1993	503	58.5	0.59	726	80.0	1.56	644	59.0	2.36	1370	69.5	1.85	47.02
1994	781	55.2	0.76	838	15.4	1.45	740	14.9	1.92	1578	15.2	1.64	46.91
1995	1099	40.7	0.88	949	13.2	1.37	979	32.3	2.01	1928	22.2	1.63	50.79
1996	1390	26.5	1.06	1082	14.0	1.47	1215	24.1	2.36	2296	19.1	1.84	52.90
1997	1989	43.1	1.50	1487	37.5	2.05	1464	20.5	2.78	2951	28.5	2.36	49.61
1998	2391	20.2	2.36	1202	-19.2	1.90	1260	-14.0	2.71	2462	-16.6	2.24	51.17
1999	2935	22.7	2.64	1310	8.9	1.91	1519	20.6	3.30	2829	14.9	2.47	53.70

Korea

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore 's total	Share of Re-exports in Total exports
1991	1876		2.84	851		2.23	542		2.61	1394		2.36	38.91
1992	2375	26.6	3.29	848	-0.4	2.08	579	6.7	2.55	1427	2.4	2.25	40.56
1993	2741	15.4	3.22	1211	42.8	2.60	847	46.4	3.11	2058	44.2	2.78	41.16
1994	3919	43.0	3.83	1316	8.6	2.27	1218	43.8	3.17	2534	23.1	2.63	48.08
1995	5399	37.8	4.34	1710	30.0	2.46	1533	25.8	3.15	3243	28.0	2.74	47.27
1996	4512	-16.4	3.44	2141	25.2	2.91	1655	8.0	3.21	3796	17.1	3.04	43.60
1997	4079	-9.6	3.08	1864	-13.0	2.57	1829	10.5	3.48	3693	-2.7	2.95	49.53
1998	3040	-25.5	2.99	1207	-35.2	1.91	1357	-25.8	2.92	2564	-30.6	2.34	52.92
1999	4167	37.1	3.75	1731	43.4	2.52	1825	34.5	3.97	3556	38.7	3.10	51.32

Table 4
Trends in Singapore's Trade with Asia-4 Economies and Hong kong (1991-99) (US$ million)

Hong Kong

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore's total	Amount	Gr.	Share in Singapore 's total	Share of Re-exports in Total exports
1991	1988		3.01	2780		7.27	1473		7.10	4253		7.21	34.63
1992	2202	10.8	3.05	3178	14.3	7.80	1783	21.1	7.85	4961	16.6	7.82	35.94
1993	2685	22.0	3.15	4159	30.9	8.91	2255	26.5	8.27	6414	29.3	8.67	35.16
1994	3461	28.9	3.38	5136	23.5	8.86	3253	44.2	8.45	8389	30.8	8.70	38.78
1995	4107	18.7	3.30	5910	15.1	8.51	4216	29.6	8.65	10126	20.7	8.57	41.63
1996	4200	2.3	3.20	6764	14.5	9.21	4361	3.4	8.46	11125	9.9	8.90	39.20
1997	3893	-7.3	2.94	7096	4.9	9.80	4925	12.9	9.36	12020	8.0	9.62	40.97
1998	2844	-27.0	2.80	5210	-26.6	8.23	4003	-18.7	8.61	9212	-23.4	8.39	43.45
1999	3186	12.0	2.87	5213	0.1	7.60	3586	-10.4	7.80	8799	-4.5	7.68	40.76

Asia-4 Economies plus Hong Kong

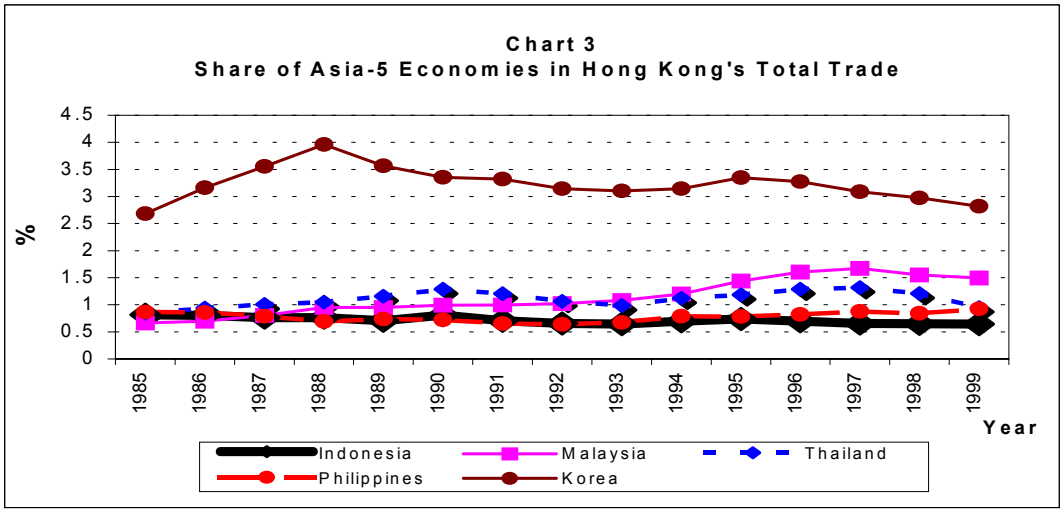
	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Combined share in Singapore Total	Amount	Gr.	Combined share in Singapore Total	Amount	Gr.	Combined share in Singapore Total	Amount	Gr.	Combined share in Singapore Total	Share of Re-exports in Total exports
1991	66102		24.66	38222		27.64	20751		39.94	58974		31.97	35.19
1992	72150	9.1	25.21	40723	6.5	26.53	22722	9.5	36.45	63446	7.6	30.08	35.81
1993	85161	18.0	27.56	46661	14.6	28.96	27280	20.1	40.42	73941	16.5	33.19	36.89
1994	102391	20.2	29.12	57962	24.2	32.39	38492	41.1	47.10	96453	30.4	38.26	39.91
1995	124395	21.5	29.16	69476	19.9	30.82	48711	26.5	47.99	118187	22.5	37.89	41.22
1996	131332	5.6	28.17	73465	5.7	30.84	51547	5.8	46.90	125012	5.8	37.46	41.23
1997	132411	0.8	27.68	72424	-1.4	31.20	52585	2.0	44.96	125008	0.0	36.99	42.06
1998	101496	-23.3	28.39	63287	-12.6	27.31	46513	-11.5	38.46	109801	-12.2	32.03	42.36
1999	110998	9.4	29.56	68628	8.4	27.78	45997	-1.1	43.77	114625	4.4	34.19	40.13

Source: Computed by authors from Singapore Trade Development Board, *Singapore Trade Statistics*, various issues

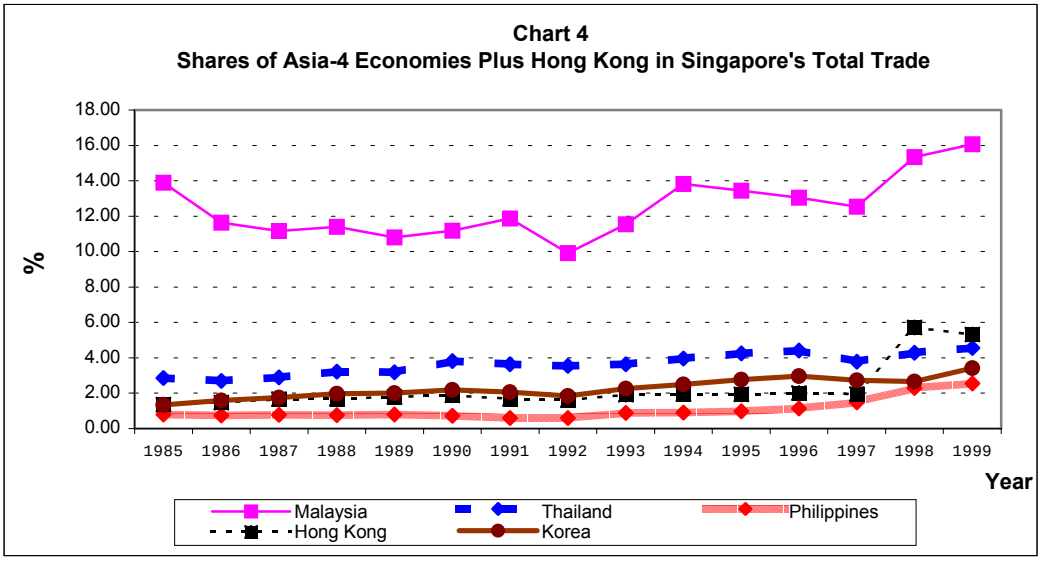
Notes: Singapore's TDB data excludes trade with Indonesia

Gr: Indicates growth rate over previous year

Except for Korea, the shares of the Asia-5 economies in Hong Kong's total exports were only about 1 percent each and less than 2 percent each in the case of imports. The combined share of all the Asia-5 economies plus Singapore in Hong Kong's total exports were only slightly over 7 percent, while those for imports were about double that. These figures respectively drop to less than 5 percent and slightly over 10 percent if Singapore is excluded. Thus Hong Kong's trade with the Asia-5 economies is quite low in comparison to Hong Kong's overall international trade (Chart 3). In contrast, about one third of Singapore's trade (imports and exports) in 1999 has been with the Asia-4 economies plus Hong Kong. However when Hong Kong and Singapore's immediate neighbour, Malaysia, is excluded, this share declines to only about 10 percent (Chart 4).



Source: Computed by author

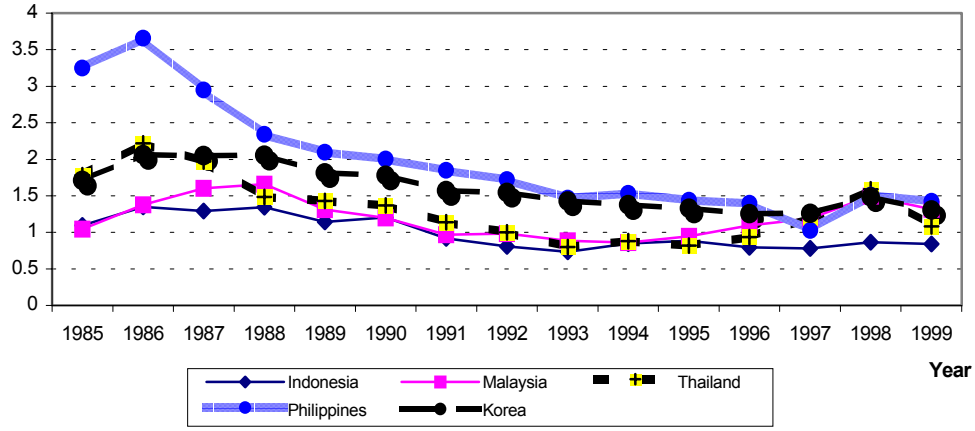


Source: Computed by authors

Trade shares as measures of the extent of trade linkages could be misleading as they fail to account for the extent to which each of the Asia-5 economies trade with the rest of the world (ROW). Accordingly, we have also computed conventional bilateral trade intensity indices (Appendix 1). These indices essentially seek to establish the relative importance of a trading partner (country j) in relation to country j's trade with the ROW.

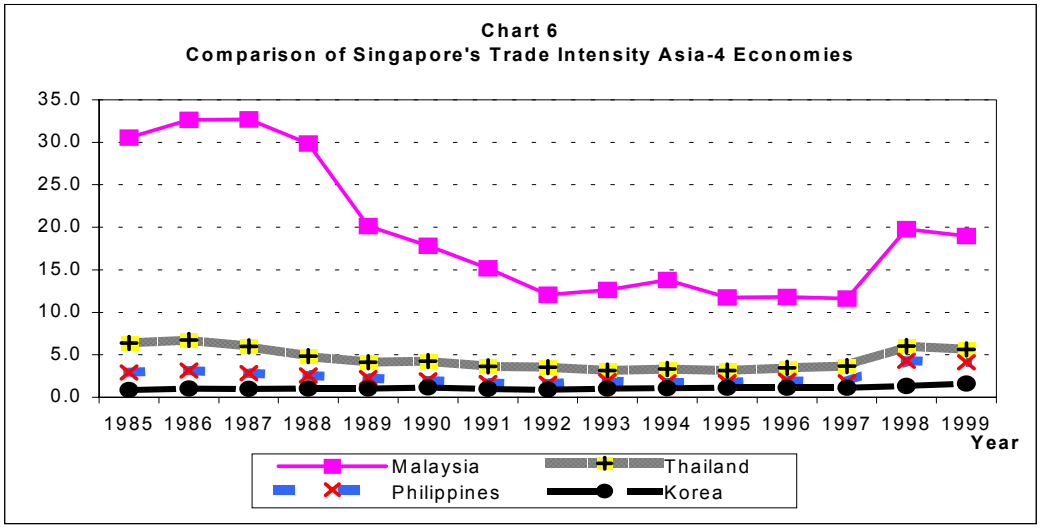
The IMF's *Direction of Trade Statistics* is used to calculate the bilateral trade intensity indices for 1985-99. Computations reveal that Hong Kong's trade intensity with the Asia-5 economies (Chart 5) has generally been between 1.0 and 1.5, which is quite low when compared to Singapore's trade intensity with these countries (Chart 6), especially for Malaysia, where the intensity index was well over 20 on average, as well as Thailand[9]. While Hong Kong's trade intensities with the region have on average been on a downward trend, that of Singapore's has been quite stable (although trade with Malaysia shows lowering bilateral intensity), and increased since 1997.

Chart 5
Comparison of Hong Kong's Trade Intensity with Asia-5 Economies



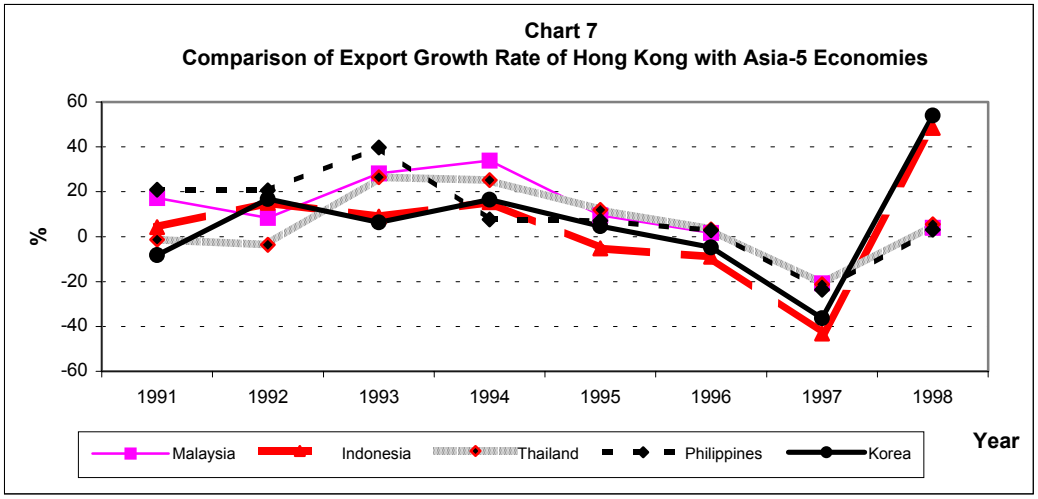
Source: Computed by authors

[9] Computation of separates import and export trade indices lead to broadly similar conclusions.

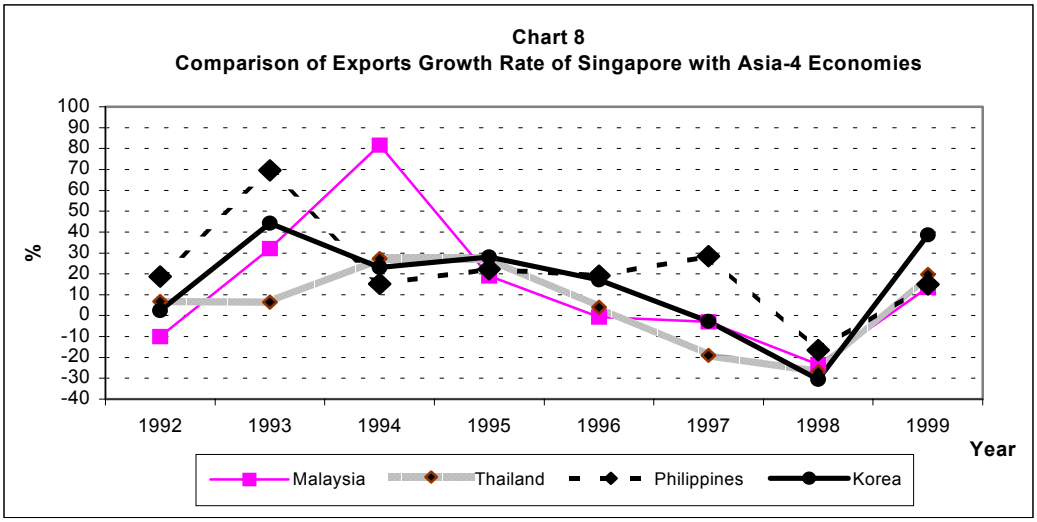


Source: Computed by authors

Consistent with the trade intensity indices, growth in Hong Kong's total exports to the Asia-5 economies has been declining sharply in the 1990s, turning negative with the onset of the crisis in 1997-98 (Chart 7). Although there was a significant increase in growth of Singapore's exports to Malaysia in the early 1990s, a sharp decline in the rate of growth was experienced from 1994, turning negative during the crisis period, but rebounding strongly thereafter (Chart 8). While the general trend remains unchanged if focus is only on domestic exports, the magnitude of the change is much less dramatic. This is in line with the fact that domestic exports have been rising as a share of Singapore's total exports to the region.



Source: computed by authors



Source: computed by authors

Recent innovations and advances in transportation, information and communication technologies have made the fragmentation or unbundling of manufactured products into parts, components and accessories (PCAs) - production of which are parceled out or scattered across countries - not only feasible, but in most cases, the cost minimising strategy. This "slicing of the value-added chain" has multiplied the opportunities for international specialisation and exchange and the consequent gains from trade for countries involved by allowing them to extend the division of labor beyond final products to PCAs (Arndt, 1998 and Krugman, 1995).

Ng and Yeats (1999) provide new statistics detailing the magnitude, composition and direction of production and trade in PCAs in East Asia, which constitute about one-fifth of East Asian manufacturing exports. While total East Asian exports between 1984 and 1996 grew by a factor of three, that of PCAs increased by a factor of about ten. Table 5 details the breakdown of intra East Asian trade by region in PCAs in 1996. Singapore's trade intensity in PCAs with Indonesia and Malaysia was exceptionally high at around 8, while that with Thailand was over 5. This indicates strong complementarities between Singapore and some of the crisis-affected economies. This is in sharp contrast to Hong Kong, whose trade intensity index for PCAs with the Asia-5 economies was just about

unity. Hong Kong's largest trade intensities (about 5) were with Mainland China and Taiwan.

Table 5
Matrix of 1996 Intra-Trade and Trade Balances in Parts and Components Among East Asian and Other Major Countries

Exporting Economy

Values of Exports of Components (US$ millions)

Partner	Hong Kong	Indonesia	Korea	Malaysia	Philippines	Singapore	Thailand	Japan
Hong Kong	-	62	535	564	154	1872	287	3500
Indonesia	18	-	334	124	19	-	64	2135
Korea	58	28	-	151	42	465	79	4445
Malaysia	77	128	314	-	94	5436	363	3959
Philippines	68	6	250	154	-	603	49	2197
Singapore	331	615	524	4201	175	-	1597	3635
Taiwan	95	24	166	292	104	644	156	4514
Thailand	94	39	226	732	611	1612	-	4157
Japan	158	310	1053	1186	686	1230	945	-
All East Asia	3051	1216	4230	7488	1895	12533	3572	32090
World	4227	1767	11917	12504	3570	23558	7071	80939

Trade Balance in Components as a Share of Component Exports (%)

Partner	Hong Kong	Indonesia	Korea	Malaysia	Philippines	Singapore	Thailand	Japan
Hong Kong	-	70.3	78.6	-11.5	-189.2	39.7	54.7	92.4
Indonesia	-117.1	-	91.5	-88.4	12.5	-	50.2	82.8
Korea	-1056.7	-308.3	-	-197.1	-646.7	-0.1	-142.4	71.4
Malaysia	-570.9	66.9	63.2	-	-129.9	21.2	-138.7	74
Philippines	-136.8	-37.8	89.2	-20.1	-	60.1	-607.6	56.9
Singapore	-466.6	63.8	50.4	36.4	-252.9	-	57.2	78.1
Taiwan	-2750.9	-543.9	-109.1	-151.9	-174.3	-82.1	-198.9	55.1
Thailand	-116.8	-38.5	64.1	-11.5	80.6	6.2	-	77.3
Japan	-3437.1	-741.4	-376.1	-313	-369.5	-356.6	-552.3	-
All East Asia	-513.2	-172.5	-55.5	-45.3	-179.2	-22	41.6	67.9
World	-517.7	-276	-16.5	-53.5	-186.7	-12.6	-101.5	70.7

Trade Intensity Index for Components

Partner	Hong Kong	Indonesia	Korea	Malaysia	Philippines	Singapore	Thailand	Japan
Hong Kong	-	0.8	1.1	1	1	1.8	0.9	1
Indonesia	0.4	-	2.6	0.9	0.5	-	0.8	2.4
Korean Rep.	0.6	0.7	-	0.5	0.5	0.9	0.5	2.4
Malaysia	0.6	2.3	0.8	-	0.8	7.2	1.6	1.5
Philippines	0.9	0.2	1.2	0.7	-	1.5	0.4	1.6
Singapore	1.8	8.1	1	7.7	1.1	-	5.2	1
Thailand	0.9	1	0.8	2.5	7.4	2.9	-	2.2
Japan	0.9	4.6	2.3	2.4	5	1.3	3.4	-

Source: Ng and Yeats (1999)

2.3 Investment Linkages

Insofar as a large part of such intraproduct specialisation has been facilitated by direct investment, particularly in East Asia (Dobson and Chia, 1998), more insight may be obtained by an examination of Singapore's and Hong Kong's direct investment to and from the Asia-5 economies. This is particularly important as foreign direct investment (FDI) inflows/outflows have contributed significantly to domestic capital formation and growth in the regional economies, especially Hong Kong and Singapore[10]. Data on direct investment itself are not always easily available, and when available, are not always directly comparable across countries.

Keeping the preceding important caveat in mind, we observe that the stock of Singapore's direct inward equity investment increased more than five-fold from US$ 14 billion in 1987 to US$ 76 billion in 1997. Among the major countries that invested in Singapore, the US, EU and Japan together accounted for nearly 56 percent of total inward direct investment in 1997 (Table 6a). While direct investment from the Southeast Asian economies to Singapore did increase gradually over time, it constituted only about 6 percent of Singapore's total inward investment in 1997. Most of this investment was from Malaysia. It is useful to note that direct investment from Hong Kong was also negligible (3 percent). More revealing is Singapore's outward investment. Singapore has, since the 1990s, attempted to develop the external wing of its economy through strategic outward investments (Table 6b). Thus total direct equity investment jumped threefold between 1992 and 1997 (US$ 28 billion). One third of the investment in 1997 was to Southeast Asia, mainly to Malaysia and Indonesia. Significantly, Hong Kong was also an important destination, accounting for 10 percent of Singapore's total outward investment in 1997.

[10] This is indicated by the fact that in 1997, the share of inward and outward FDI in Singapore's GDP was 82 and 46 percent, respectively; that in Hong Kong's GDP was 55 percent and 79 percent respectively. In 1996, these shares in Singapore's Gross Fixed Capital Formation (GFCF) amounted

Table 6a
Singapore: Inward Stock of Foreign Direct Equity Investment by Country of Origin (US$ billion)

	Amount				Shares in total				C.A.G.R		
	1987	1992	1995	1997	1987	1992	1995	1997	1987-92	1992-95	1995-97
US	3.8	5.9	10.0	14.0	26.6	17.0	16.9	18.4	9.4	19.2	18.0
EU	3.0	8.0	12.2	15.4	20.8	23.1	20.6	20.3	22.1	15.1	12.0
Japan	2.2	8.1	12.0	13.7	15.3	23.3	20.1	18.1	30.1	13.9	7.0
Hong Kong	0.9	2.1	2.8	2.5	6.5	6.1	4.6	3.4	18.2	9.0	-3.8
Malaysia	0.6	1.4	2.5	3.1	4.3	3.9	4.2	4.2	17.3	22.1	12.6
Indonesia	0.1	0.0	0.6	0.7	0.6	0.1	0.9	1.0	-14.5	145.1	15.3
Philippines	0.0	0.1	0.3	0.1	0.1	0.3	0.4	0.1	49.1	39.6	-41.2
Thailand	0.0	0.3	0.6	0.5	0.1	0.9	1.0	0.6	72.1	21.2	-7.4
ASEAN	0.8	1.9	4.0	4.6	5.4	5.4	6.7	6.0	19.5	28.9	6.9
Total Direct equity investment	14.2	34.8	59.3	75.8					19.6	19.5	13.0

Source : Calculated from *Yearbook of Statistics, Singapore*, various issues
Note: C.A.G.R - compounded annual growth rate

Table 6b
Singapore : Stock of Foreign Direct Equity Investment Abroad by Host Country (US $ billion)

	Amount			Shares in total			C.A.G.R	
	1992	1995	1997	1992	1995	1997	1992-95	1995-97
US	1.0	1.5	1.8	9.0	5.3	4.9	14.7	9.3
EU	0.9	2.7	5.0	8.3	9.9	13.9	44.1	35.8
Japan	0.0	0.3	0.3	0.4	1.0	0.9	81.3	10.9
Hong Kong	1.9	3.8	3.8	17.2	13.8	10.5	26.7	-0.2
Malaysia	2.4	5.4	4.2	22.1	19.7	11.7	31.2	-11.8
Indonesia	0.2	2.3	3.2	1.8	8.4	8.7	126.0	16.4
Philippines	0.1	0.4	0.5	0.6	1.6	1.4	88.4	7.8
Thailand	0.3	0.7	0.5	2.6	2.5	1.3	34.8	-16.0
ASEAN	3.0	9.2	9.0	27.6	33.2	24.8	44.9	-1.1
Total Direct equity Investment	10.9	27.6	36.2				36.3	14.5
Nominal Exchange rate (S $ / US $)	1.63	1.42	1.48					

Source : Calculated from *Yearbook of Statistics, Singapore*, various issues
Note: C.A.G.R – compounded annual growth rate

Four countries, viz. Japan, UK, China and USA, accounted for almost four-fifths of Hong Kong's total inward investment in 1997 (which totaled about US $170 billion) (Table 7a). The Asia-5 economies were not significant investors in Hong Kong, and neither was Singapore. Hong Kong's outward investments were overwhelmingly directed towards Mainland China (US$267 billion in 1997) (Table 7b). The only other significant investment destination was Indonesia (US$15.6 billion in 1997). Direct investment to Singapore, Thailand, Malaysia, the Philippines and Korea *in aggregate* constituted less that US$8 billion in investments in 1997.

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to 23 percent (inward) and 18 percent (outward), respectively; that of Hong Kong amounted to 12

Table 7a
Hong Kong Total Value of Net Assets at Historical Costs Attributed to Inward Foreign Direct Investment by Country (US$ billion)

	Amount				Share in total				Growth rate		
Country	1994	1995	1996	1997	1994	1995	1996	1997	1995	1996	1997
Japan	21.2	24.5	36.2	48.2	23.6	24.6	28.5	28.4	15.6	47.8	33.1
UK	20.7	21.2	24.2	27.8	23.1	21.3	19.1	16.4	2.4	14.2	14.9
China	17.2	19.1	22.3	28	19.2	19.2	17.6	16.5	11.0	16.8	25.6
USA	11.2	12	16.1	21	12.5	12.0	12.7	12.4	7.1	34.2	30.4
Italy	2.2	2.3	2.6	2.6	2.5	2.3	2.0	1.5	4.5	13.0	0.0
France	1.8	1.7	2.3	7.2	2.0	1.7	1.8	4.2	-5.6	35.3	213.0
Germany	1.2	1.6	1.8	2.1	1.3	1.6	1.4	1.2	33.3	12.5	16.7
Netherlands	1.3	1.6	2.1	6.6	1.4	1.6	1.7	3.9	23.1	31.3	214.3
Others	9.8	12.3	19.3	28.2	10.9	12.3	15.2	16.6	25.5	56.9	46.1
Total	89.7	99.7	126.9	169.7							

Source: Hong Kong Government Industry Department and Census and Statistics Department
Note: Figure for Italy in 1997 captured investment value for non-manufacturing sector only

Table 7b
Hong Kong Overseas Direct Investment in Selected Economies As of May 1997 (US$ billion)

Country	Cumulative Value *	Reference Period	Ranking **
China	266.9	End-1996	1st
Indonesia	15.6	End-Mar 1997	3rd
Thailand	2.7	End-Sep 1996	2nd
Taiwan	2	End-1996	3rd
Vietnam	3.1	End-1996	3rd
Philippines	0.72	End-1996	3rd
Singapore	2.7	End-1992	4th
South Korea	0.65	End-1996	5th
Malaysia	1.1	End-1995	N/A
United States	1.3	End-1995	28th
Australia	0.6	End-June 1996	12th
Japan	0.72	End-Mar 1995	7th

Note: * Except those for Singapore, Thailand, the United States and Australia, all investment figures are compiled on approval basis. Direct comparison of the figures is not recommended, though, due to different definitions and coverages adopted by the governments of the countries concerned.
** Hong Kong's ranking in the country concerned

According to the United Nations *World Investment Report 1996*, Hong Kong was the fourth-largest outward investor in the world in 1995 Hong Kong, at US$25 billion, was outranked only by the United States (US$95.5 billion), the U.K. (US$37.8 billion) and Germany (US$35.3 billion). The report also noted that Hong Kong was the sixth-largest recipient of capital inflows in Asia, with the amount reaching US$2.1 billion

Source: U.S Consulate General *Hong Kong's 1999 Investment Climate Report*

Prepared by the U.S. Consulate General Economic/Political Section, in conjunction with the Foreign Commercial Service Section

and 55 percent, respectively (UNCTAD, 1999).

2.4 Evaluating the Significance of the Complementarity-driven Trade Channel

All in all, Singapore's high intensity of trade with and investments in Malaysia suggests that complementarity-based trade spillovers were a significant transmission channel of contagion to Singapore. Malaysia in turn was the most susceptible to contagion from Thailand given their extensive finance and trade linkages (Kaminsky and Reinhart, 1999)[11]. Simple cointegration tests of the effects of foreign demand on Singapore's GDP for the period 1980 to 1997 supports this conclusion. The elasticity of Singapore's GDP with respect to Malaysia averaged one-third, as it did with the US (IMF, 2000). On the other hand, the data do not reveal any significant interdependencies between Hong Kong and the Asia-5 economies. It is therefore unlikely that either direct demand or supply-driven trade spillovers with the Asia-5 economies played a role in its contagious spread to Hong Kong. This leads us to examine the possibility that the crisis spread via indirect or competitiveness-driven trade spillovers.

3. Spillover due to Trade Competition

It has become legion to think of trade, growth and development in East Asia in terms of Japan as the most advanced economy, producing and exporting new goods before others in the region. Japan in turn has been closely followed by the four economies, Hong Kong, Korea, Singapore, and Taiwan, collectively referred to as the "Four Tigers" or "Gang of Four". Then come the other crisis-hit economies (Malaysia, Thailand and Indonesia), and behind them, Mainland China[12].

Accordingly, the devaluation of the currencies of the three Tiger economies in 1997-98 may have placed Hong Kong, which persisted with its US dollar-based currency

[11] Dungey and Martin (2000) find that trade spillovers from Thailand accounted for 63 percent of the volatility of the Malaysian ringgit.

board arrangement, at a competitive disadvantage. Empirical estimation of "equilibrium" exchange real exchange rates in Hong Kong and Singapore is instructive in this regard (Rajan and Siregar, 2000 and IMF, 2000). While Singapore's exchange rate had been maintained at a competitive level (i.e. at a level consistent with "underlying macroeconomic fundamentals") prior to and throughout the East Asian crisis, Hong Kong's exchange rate was overvalued pre-crisis, and the degree of overvaluation deteriorated sharply during the crisis following the spate of regional currency devaluation[13].

3.1 Revealed Comparative Advantage

In search of the significance of the competition-driven trade channel, we compare the comparative advantages of the two city-states and the Asia-5 economies. While we would ideally like to examine relative factor endowments of each of the economies in question, data limitations necessitate focusing on ex-post comparative advantage. For this purpose, shifts in comparative advantage are identified using the export index of "Revealed Comparative Advantage" or RCA (Balassa and Noland, 1989). This index (explained in Appendix 2) has been fairly widely used to explain the export performance and similarity of trade patterns among the East Asian economies (for instance, see Chow, 1990 and Rana, 1990).

We compute the RCAs for Singapore, Hong Kong and the Asia-5 economies, so as to enable a cross-country comparison of shifting comparative advantage. The indices are calculated for four years: 1982, 1987, 1992 and 1996, a year before the crisis began with the devaluation of the Thai baht in July 1997 (Table 8)[14]. Our analysis focuses on the

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[12] This pattern of comparative advantage across economies in the region has been referred to as the "flying geese formation" due to Japanese economist, Akamatsu (1962). Feenstra and Rose (2000) provide a recent confirmation of this phenomenon.

[13] However this does not necessarily follow that Hong Kong would be well advised to forsake its currency board regime in favour of a more flexible regime. First, the orchestration of an exit from a fixed exchange rate regime to a flexible one is a difficult maneuver that could be destabilising (Eichengreen, 1999 and Eichengreen et al., 1999). Second, Hong Kong authorities may see political value in maintaining the exchange rate on autopilot, hence ensuring some degree of economic sovereignty from Mainland China.

[14] We do not show the index for 1982 in Table 8.

exports of selected product groups of manufacturing exports according to the relative factor intensities product classification used by Garnaut and Anderson (1980). In particular, we classify product groups of trade into four main categories: unskilled labour intensive goods, physical capital intensive goods, human capital intensive goods and technology intensive goods (Table 9). The data source used is the *UN International Trade Statistics Yearbook*.

Table 8
Revealed Comparative Advantage (RCA) Indices

UNSKILLED LABOUR INTENSIVE GOODS					PHYSICAL CAPITAL INTENSIVE GOODS				
Countries	**RCA**	**1987**	**1992**	**1996**	**Countries**	**RCA**	**1987**	**1992**	**1996**
HONG KONG	RCA >1	4.48	3.81	3.54	HONG KONG	RCA >1	_	_	_
	RCA <1	_	_	_		RCA <1	0.34	0.47	0.52
SINGAPORE	RCA >1	_	_	_	SINGAPORE	RCA >1	_	_	_
	RCA <1	0.81	0.64	0.43		RCA <1	0.54	0.69	0.62
INDONESIA	RCA >1	_	1.88	1.73	INDONESIA	RCA >1	_	_	_
	RCA <1	0.57	_	_		RCA <1	0.20	0.17	0.24
KOREA	RCA >1	3.70	2.94	2.25	KOREA	RCA >1	_	_	_
	RCA <1	_	_	_		RCA <1	0.53	0.69	0.68
THAILAND	RCA >1	2.04	2.08	1.97	THAILAND	RCA >1	_	_	_
	RCA <1	_	_	_		RCA <1	0.20	0.30	0.39
MALAYSIA	RCA >1	_	_	_	MALAYSIA	RCA >1	_	_	_
	RCA <1	0.37	0.77	0.73		RCA <1	0.19	0.35	0.37
PHILIPPINES	RCA >1	1.16	1.36	1.54	PHILIPPINES	RCA >1	_	_	_
	RCA <1	_	_	_		RCA <1	0.35	0.17	0.15

TECHNOLOGY INTENSIVE GOODS					HUMAN CAPITAL INTENSIVE GOODS				
Countries	**RCA**	**1987**	**1992**	**1996**	**Countries**	**RCA**	**1987**	**1992**	**1996**
HONG KONG	RCA >1	1.16	1.07	1.18	HONG KONG	RCA >1	_	_	_
	RCA <1	_	_	_		RCA <1	0.64	0.62	0.62
SINGAPORE	RCA >1	2.15	2.56	2.69	SINGAPORE	RCA >1	_	_	_
	RCA <1	_	_	_		RCA <1	0.33	0.34	0.35
INDONESIA	RCA >1	_	_	_	INDONESIA	RCA >1	_	_	_
	RCA <1	0.05	0.23	0.44		RCA <1	0.06	0.18	0.35
KOREA	RCA >1	1.16	1.40	1.54	KOREA	RCA >1	_	_	1.19
	RCA <1					RCA <1	0.93	0.89	_
THAILAND	RCA >1	_	1.15	1.23	THAILAND	RCA >1	_	_	_
	RCA <1	0.59				RCA <1	0.30	0.42	0.51
MALAYSIA	RCA >1	_	1.45	1.45	MALAYSIA	RCA >1	_	_	_
	RCA <1	0.65	_	_		RCA <1	0.09	0.29	0.32
PHILIPPINES	RCA >1	_	_	2.42	PHILIPPINES	RCA >1	_	_	_
	RCA <1	0.20	0.91			RCA <1	0.09	0.10	0.16

Source: Compiled by authors from UN, *International Trade Statistics Yearbook, various years*

Table 9
Classification of Commodities by Relative Factor Intensities

Factor Intensity & SITC code	Product Category
Unskilled Labour Intensive (ULI) goods	
65	Textile yarn, nes
651	Textile yarn
652	Cotton fabrics, woven
653	Fabrics, woven of man-made fibres
654	Other textile fibres
651-654	Textile Yarn and fibres
657	Special textile fabrics
664	Glass
665	Glassware
666	Pottery
664-666	Glass and Pottery items
81	Sanitary, plumb fixtures
82	Furniture and parts
83	Travel goods
84	Apparel and clothing accessories
85	Footwear
89-896-897	Misc.- jewellery , art antiques
894	Baby carriages, toy
Human Capital Intensive (HCI) goods	
55	Essential oils
62	Rubber manufactures
64	Paper , paperboard
69	Metal manufactured Nes
775	Household electric and non-elec. Equipment
78	Road vehicles
79	Other transport eqpmnt.
885	Watches and clocks
896-897	Works of art, and jewellery
Technology Intensive (TI) goods	
54	Medicinal and pharma pdts.
56	Fertilizers, manufactured
57	Explosives and pyrotechnic
58	Artificial resins and plastic materials
59	Chemical material and pdts.
752	Automatic data process
759	Parts,nes of and accessories
76	Telecommunication equipment
77-775	Electrical machinery and parts thereof
87	Professional, scientific, and controlling instruments
88-885	Photographic apparatus- watchclock
Physical Capital Intensive (PCI) goods	
51	Organic chemicals
52	Inorganic chemicals
67	Iron and Steel
68	Non ferrous metals
71	Powergenerating machinery
72	Machinery specialized
73	Metalworking machinery
74	General industrial machinery and equipment,nes
751	Office machines

Source: Adapted from Garnaut and Anderson (1980)

Between 1982 and 1996, while Hong Kong's level of specialisation in unskilled labour intensive goods (as proxied by the RCA index) fell from 7.1 in 1982 to 3.5 in 1996, it was unable to shift its specialisation towards technology intensive goods, the RCA falling from 1.5 in 1982 to 1.2 in 1996. In contrast, Singapore was successful in increasing its specialisation significantly in technology intensive goods (its RCA in this product group rising from 1.5 in 1982 to 2.7 in 1996), while decisively moving away from other categories.

What about the Asia-5 economies? Except for Indonesia, the rest moved towards greater specialisation in technology intensive goods. However other than the Philippines, their average RCA hovered between 1 and 1.5, closer to that of Hong Kong. While Hong Kong, Korea and Thailand (along with an Indonesia) had a comparative advantage in labour intensive goods, the Philippines in contrast seems to have been the closest export competitor to Singapore, with a RCA in technology intensive products of 2.4. But unlike Singapore, the Philippines also had a RCA in unskilled labour intensive goods during this time.

Data on final goods provide only a partial analysis. As noted, PCAs have constituted a large and growing share of East Asian trade in manufactured goods. Table 10 highlights the export RCA index values for the Asia-5 economies, Hong Kong and Singapore. Based on a simple average of available PCA categories, Hong Kong's and Korea's RCAs were below unity; in contrast, Singapore's RCA index was 1.4, close to that of Malaysia's (1.7), Indonesia and Thailand (about 1.5 each). The Philippines had a strong RCA in PCAs (index value of 2.3). A comparison of the ten largest exports of these economies further reveals a significant overlap between Malaysia, Singapore and Thailand (Ng and Yeats, 1999)[15].

[15] The main products were Office Machines, Telecommunications, Switchgear and Electronic components.

Table 10
Percentage of All Parts and Components Products in Which East Asian Economies have a Comparative Advantage

	RCA Index	
	1985	1996
Hong Kong	16.7	21.7
Indonesia	0	6.7
Korea	0	10
Malaysia	20	20
Philippines	10	13.3
Singapore	25	26.7
Thailand	10	20
Japan	21.7	26.7

Source: Ng and Yeats (1999)

3.2 Export Similarity

While the RCA index using export statistics is useful as a first test of trade complementarity, it is a proxy measure of specialisation in *production* and not necessarily *exports*. As Ng and Yeats (1999, p.21) have noted, the RCA index "must be used with some caution since domestic measures that have nothing to do with comparative advantage (like local subsidies) or foreign trade barriers, can impart a bias in the index". It fails to capture direct product competition between regional economies with similar export structures.

Table 11 lists the top twenty exports of Singapore and Hong Kong at the SITC-3 digit level for 1999[16]. Out of the twenty products, eight products overlap between the two economies. All these products belong to the category of machinery and transport equipment, and more specifically, electronic products and electrical equipment[17]. A further analysis of the top five exports at the SITC-3 digit level of both these economies to the

[16] The pattern is almost similar for 1990 and 1995.

[17] The product categories are: Electronic Valves (SITC 776), Parts for Data Processing Machines (SITC 759), Data Processing Machines (SITC 752), Telecommunication Equipment (SITC 764), Electrical Machinery (SITC 778, SITC 771), and audio and video broadcasting and recording equipments (SITC 762 and SITC 763).

Asia-5 economies and three other important regions, viz. the US, Japan and East Asia, reveals the above five products to have figured in the top most product group of Singapore's exports to all of them during the 1990s[18]. In contrast, only three product groups among the electronic category, viz. SITC 759, SITC 776 and SITC 764 were among the top exports of Hong Kong to the three regions. This indicates that Singapore and Hong Kong had only a limited extent of export overlap in terms of products and export markets.

Table 11
List of selected product group of Singapore and Hong Kong exports for which export similarity indices have been calculated

SITC Code	Product group
894	Toys Games Etc
764	Telecommunications Equipment
759	Parts For Office & D/P Machines
776	Electronic Valves
851	Footwear
885	Watches & Clocks
845	Apparel Articles Of Textile
831	Travel Goods
752	Data Processing Machines
893	Articles Of Plastic
778	Electrical Machinery Nes
772	Electrical Circuit Apparatus
771	Electrical Power Machinery
842	Women's Clothing Woven
762	Radio-Broadcast Receivers
899	Misc Mfd Articles Nes
651	Textile Yarn Thread
775	Household Goods
652	Cotton Fabrics Woven
653	Fabrics Woven Man-Made Fbrs
763	Video & Sound Recorders Etc
334	Petroleum Products Refined

Note: The above products figure either in Singapore's or Hong Kong's top 20 exports to the world market
Source: UN, *International Trade Statistics* Yearbook, various years

Table 12 highlights the cross-country correlation of export structures at the 3-digit SITC level in 1995. Singapore's export structure was most similar to Malaysia, Thailand, Korea and the Philippines (average correlation coefficient of 0.68), while being almost completely uncorrelated with Indonesia. While Hong Kong's export structure was slightly more correlated with Indonesia (0.17), it was relatively less correlated with the other crisis-

[18] Petroleum products refined (SITC 334) are another important category of exports to all these countries.

hit economies (0.47)[19]. Lastly, the correlation between Hong Kong's and Singapore's export structures was relatively low (0.37), consistent with the previous findings using the RCA indices.

Table 12
Correlation of East Asian Manufactured Export Structures, 1985 and 1995

Economy	Hong Kong	Indonesia	Korea	Malaysia	Philippines	Singapore
Indonesia	0.172					
Malaysia	0.432	0.183	0.737			
Philippines	0.512	0.218	0.664	0.823		
Singapore	0.367	0.078	0.667	0.749	0.62	
Thailand	0.547	0.217	0.524	0.597	0.581	0.705

Source: World Bank (2000)

4. Concluding Observations

The literature on the East Asian crisis has concentrated almost exclusively on the five crisis-hit economies. Scant attention has been paid to Hong Kong and Singapore, both of which also suffered from contagious fallout from the crisis, despite being well acknowledged as having relatively sound financial and economic fundamentals. This paper has examined the extent to which trade spillovers have been important in transmitting regional contagion to Hong Kong and Singapore.

The overall analyses of trade and direct investment links suggest that, underpinning the transmission of the regional shocks to Singapore was its close trade complementarities with Malaysia in particular. Singapore's competitive export structures to four of the five crisis-hit economies, especially in parts and components, may also have been an important factor in spreading the crisis to Singapore. The case of Hong Kong is much more curious. It had very low trade and investment interdependencies with the Asia-5 economies, and while there is some evidence of export similarity with the crisis economies, this was far less than that of Singapore's. This conclusion is consistent with the findings of Abeysinghe (1999). Using a structural VAR model that transforms a trade matrix (capturing both direct and indirect trade linkages) to output multipliers (impulse responses for three years after the

[19] While a more complete picture can only be obtained by a comparison of export structures to major third markets, data limitations preclude such an analysis from being undertaken.

shock), he finds that the transmission effect from the regional economies to Hong Kong is "very small". In contrast, regional transmission of shocks to Singapore due to trade is "relatively high" over time (Table 13). All of this leads to the conclusion that one needs to look elsewhere -- spillovers due to non-trade related reasons, "pure contagion" or common shocks -- for a rationalisation of the transmission of the East Asian crisis to Hong Kong.

Table 13
Multiplier Effects of a Negative Shock (-1 percent) on GDP Growth

Country	Source of shock	Multipliers over quarters						
		1	2	4	6	8	10	12
Malaysia	Within	-0.104	-1	-1.34	-0.158	-1.7	-1.78	-1.82
	Transmission	-0.33	-0.45	-0.88	-0.1	-1.08	-1.15	-1.17
Indonesia	Within	-1	-1.02	-1.24	-1.48	-1.57	-1.64	-1.67
	Transmission	0.04	-0.01	-0.41	-0.64	-0.71	-0.78	-0.86
Thailand	Within	-1.01	-0.93	-0.55	-0.127	-0.78	-1.37	-0.9
	Transmission	-0.2	-0.3	-0.79	-0.88	-1.16	-1.07	-1.33
Philippines	Within	-1.01	-0.93	-0.97	-1.26	-1.29	-1.38	-1.4
	Transmission	-0.45	-0.41	-0.42	-0.57	-0.6	-0.68	-0.67
Singapore	Within	-1.05	-1.27	-1.75	-1.59	-1.64	-1.7	-1.62
	Transmission	-0.71	-0.78	-1.52	-1.73	-1.74	-1.88	-1.9
Hong Kong	Within	-1.01	-0.88	-0.99	-1.12	-1.16	-1.18	-1.19
	Transmission	-0.12	-0.11	-0.11	-0.16	-0.14	-0.15	-0.15
Korea	Within	-1.02	-0.53	-0.7	-0.52	-0.51	-0.58	-0.56
	Transmission	-0.95	-0.73	-0.93	-1.06	-1.35	-1.44	-1.34

Note: Transmission multipliers show the impact on the country concerned of a -1% shock in each of the other 6 combined
Source: Abeysinghe (1999)

A recent study by Rzepkowski (2000) of specific speculative dynamics, involving the stock, index futures and options markets in Hong Kong to estimate the expected probability and intensity of devaluation over a one-month horizon, from February 1997 to the end of 1998, is instructive. He finds that in addition to common shocks (or industrial country effects such as variations in the dollar-yen rate), shocks to Hong Kong were propagated primarily via pure contagion rather than financial interlinkages. Insofar as the literature has thus far not been able to converge onto a consistent definition of financial sector spillovers, and in particular, distinguishing it clearly from pure contagion, this is an area that deserves far more attention. Certainly, some of Hong Kong's banks and finance companies had large

exposures to the Asia-5 economies. Consequently there were bound to be negative repercussions on Hong Kong's domestic economy[20]. Financial linkages between Singapore and the regional economies were also fairly intensive. Since Singapore has served as a commercial hub for Southeast Asia (i.e. the region's financial, trading and trans-shipment center), the economy was also invariably impacted by a decline in these hub-related service activities.

[20] Another important financial linkage has been the withdrawal of Japanese bank lending from the two city-states to meet losses in Japan and the Asia-5 economies.

Appendix 1: Trade Intensity Index

The bilateral trade intensity index for total trade may be stated as follows:

$$T_{ij} = \frac{[(X_{ij}+M_{ij})/(X_i+M_i)]}{\{[X_{wj}+M_{wj})-(X_{ij}+M_{ij})]/[(X_w+M_w)-(X_i+M_i)]\}} \quad (1)$$

where T_{ij} = total trade intensity index of country i with country j; X_{ij} = exports of country i to j ; M_{ij} = imports of country i from j; X_i = total exports of country i; M_i = total imports of country i; X_{wj} = total world exports to country j ; M_{wj} = total world imports from country j; X_w = total world exports; and M_w = total world imports. The numerator in eq. (1) represents the share of bilateral trade between country i and j as a percentage of country i's total trade. The denominator represents the total trade of country j with the world excluding country i as a share of total world trade (excluding country i). If the numerator exceeds the denominator, i.e. if the value of $T_{ij} > 1$, then it implies that the bilateral trade intensity for country i with country j is greater than in comparison to country j's trade with the rest of the world (ROW), i.e. more "intensive" trade relations.

Appendix 2: Revealed Comparative Advantage (RCA) Index

The RCA index represents the ratio of the share of country i in world exports of commodity k to its share of total commodity exports:

$$RCA = \frac{X_i^k / X_i}{X_w^k / X_w} \quad (2)$$

where: X_i^k = exports by country i of commodity k; X_w^k = world exports of commodity k; X_i = total exports of country i; and X_w = total world exports. The weighted average of RCAs of all commodities add up to unity. The RCA ranges between zero and unity in case a country is not specialised in exports of that category and from one to infinity if it is specialised[21].

[21] Hence the RCA index is not symmetric. Since the range of RCA values lead to a skewed distribution, it violates the assumption of normality of errors in case of a regression model estimated using these values (Laursen, 1998).

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