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HOW IMPORTANT WERE TRADE SPILLOVERS?**

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Hong Kong, Singapore and the East Asian Crisis: How Important were 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 the “twin cities” of 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.

JEL Classification: F30, F32, F34

Key words: Competition, Complementarity, Contagion, Crisis, East Asia, Hong Kong, Singapore

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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 economic growth.

While contagion could take on a *global* dimension², 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 percentage 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, the Philippines and Malaysia, the second stage of the crisis (October to December 1997) impacted the higher income economies, viz. Taiwan, South Korea and the “twin cities” 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 economies had among the strongest macroeconomic fundamentals and most robust financial systems in the region (Table 1), and among emerging economies as a whole. Yet they did suffer from the regional crisis.

The Singapore dollar depreciated by about 15 per cent relative to the U.S. 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 U.S. 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 (Chart 2). The inevitable result was a deep recession, with Hong Kong’s overall GDP declining by 5 per cent in 1998 compared to an average annual growth of about 5 per cent 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 per cent), a sharp contrast to the annual average growth of 9 per cent in the first half of the 1990s (Table 1).

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 Reinhart (2000) find that vulnerability to contagion is highly “nonlinear”, with the probability of a 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 centers with strong regional trade (and investment) links⁵, 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 U.S. 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

Trade spillovers could either be due to “complementarity” or “competitiveness” 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, thereby compressing imports (see Bird and Rajan, 2001 and references cited within). This 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 labour 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 region’s 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).

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.

The aim of this paper is to establish the intensity of trade and real investment linkages between the crisis-affected economies, viz. Indonesia, Malaysia, Thailand, the Philippines and Korea (henceforth referred to as the Asia-5 economies) and Hong Kong and Singapore, as well as to ascertain the importance of trade spillovers in spreading the regional downturn to the twin cities.

The layout of the remainder of this paper is as follows. Section 2 focuses on trade complementarities, examining patterns of Hong Kong's and Singapore's trade and real investment linkages with the Asia-5 economies. Section 3 turns its attention to the nature of the competitiveness-driven trade spillover channel, investigating the degree of similarity of comparative advantage and export structures of the regional economies. Having outlined the nature of direct and indirect channels of trade linkages, Section 4 quantifies the economic impacts of the economic slowdowns in the Asia-5 economies on Hong Kong's and Singapore's GDPs. The final section provides a summary by way of concluding. An Appendix describes the direct trade effect index used in Section 4.

2. Channels of Trade Complementarity

a) *Data Preliminaries*

Since Hong Kong and Singapore are both engaged in a significant amount of entrépot 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 a domestic export. 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 a re-export. Failure to clearly distinguish between these two components of exports could potentially distort aggregate trade figures.

Trading partners of entrépot 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 per cent between imports reported *c.i.f.* and exports reported *f.o.b.*). The potential for discrepancies lies more with other trading partners that engage 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 shows it to have fairly large trade surpluses with its trading partners, mainly due to inclusion 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).

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

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 published by the Singapore Trade Development Board's *Trade Statistics* and the Census and Statistics Department of Hong Kong in its *Annual Review of Hong Kong External Trade* 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 merchandise trade.

b) 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 per cent 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 per cent. 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 each of 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.

Except for Korea, the shares of the Asia-5 economies in Hong Kong's total exports were only about 1 per cent each and less than 2 per cent each in the case of imports. The combined share of all the Asia-5 economies plus Singapore in Hong Kong's total exports was only slightly over 7 per cent, while that for imports was about double that. These figures respectively drop to less than 5 per cent and slightly over 10 per cent 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. In contrast, about one-third of Singapore's trade (imports and exports) in 1999 has been with the Asia-5 economies plus Hong Kong. However, when Hong Kong and Singapore's immediate neighbour, Malaysia are excluded, this share declines to only about 10 per cent.

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, it is also useful to compute conventional bilateral trade intensity indices. 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 bilateral trade intensity index for total trade may be stated as follows:

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

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.

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 $T_{ij} > 1$, the implication is 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.

We use the IMF's *Direction of Trade Statistics* to calculate the bilateral trade intensity indices for 1985-99. Computations reveal that Hong Kong's trade intensity with the Asia-5 economies has generally been between 1.0 and 1.5, which is quite low when compared to Singapore's trade intensity with these countries, 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 been on a downward trend on average, that of Singapore's has been quite stable (although trade with Malaysia shows lowering bilateral intensity), and increased since 1997.

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 (Table 3). Although there was a significant increase in growth of Singapore's exports to Malaysia in the early 1990s, a marked decline in the rate of growth was experienced from 1994, turning negative during the crisis period, but rebounding strongly thereafter (Table 4). 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.

c) *Intraproduct Regional Trade*

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 labour 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. Singapore's trade intensity in PCAs with Indonesia and Malaysia was

⁹ Computation of separate import and export trade indices leads to broadly similar conclusions.

exceptionally high at around eight, while that with Thailand was over five. 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 five) were with Mainland China and Taiwan.

d) Investment Linkages

Insofar as a large part of such intraproduct specialisation has been facilitated by direct investment, particularly in East Asia (Dobson and Chia, eds., 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 U.S., the EU and Japan together accounted for nearly 56 per cent of total inward direct investment in 1997 (Table 5a). While direct investment from the Southeast Asian economies as a whole to Singapore did increase gradually over time, it constituted only about 6 per cent 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 per cent). More revealing is Singapore's outward investment. This is particularly so as the Singapore government has, since the 1990s, attempted to develop the external wing of its economy through strategic outward investments as part of its "Regionalisation 2000" drive.¹¹

Thus total direct equity investment abroad jumped threefold between 1992 and 1997 (US\$ 28 billion) (Table 5b). One-third of its investment in 1997 was in Southeast Asia, mainly to Malaysia and Indonesia. Significantly, Hong Kong was also an important destination, accounting for 10 per cent of Singapore's total outward investment in 1997. Four countries, viz. Japan, the U.K., China and the U.S., accounted for almost four-fifths of Hong Kong's total inward investment in 1997 (which totaled about US\$170 billion) (Table 6a). The Asia-5 economies were not significant investors in Hong Kong, and neither was Singapore. During the same period, Hong Kong's outward investments were overwhelmingly directed towards Mainland China (US\$267 billion) (Table 6b). The only other significant investment destination

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 per cent, respectively; that in Hong Kong's GDP was 55 per cent and 79 per cent respectively. In 1996, these shares in Singapore's Gross Fixed Capital Formation (GFCF) amounted to 23 per cent (inward) and 18 per cent (outward), respectively; that of Hong Kong amounted to 12 and 55 per cent, respectively (UNCTAD, 1999).

¹¹ This program, launched following the recommendations of the report of the Committee to Promote Enterprise Overseas by the Singapore Government in 1993, is aimed at strengthening the external economy of Singapore through overseas investments, combining its strengths with that of the host economy. The aim of this strategy is to establish "good economic and political relations with other countries in the region, through political diplomacy, outward investment and joint ventures to combine the competitive strengths of Singapore and its partners to attract international investors" (Chia, 1998). As part of this strategy, the government has encouraged partnerships between its statutory boards, Government Linked Companies (GLCs), and the private sector to promote investments overseas.

was Indonesia (US\$15.6 billion in 1997). Direct investment to Singapore, Thailand, Malaysia, the Philippines and Korea *in aggregate* constituted less than US\$8 billion in investments in 1997.

3. Nature and Patterns of 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 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, 1999). 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 devaluations.¹³

a) *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 has been quite 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).

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:

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

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

¹³ However, it 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., 1998). 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 (Rajan and Siregar, 2000).

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 adds 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.¹⁴

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 computed 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 7).¹⁵ Our analysis focuses on the 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. The data source we use here is the *UN International Trade Statistics Yearbook*.

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 Indonesia) had a comparative advantage in labour intensive goods, the Philippines in contrast seems to have been the closest export competitor to Singapore, with an RCA in technology intensive products of 2.4. But unlike Singapore, the Philippines also had an 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. Ng and Yeats (1999) calculated the export RCA index values for the Asia-5 economies, Hong Kong and Singapore. Based on a simple average of available PCA categories, they find that 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), while the Philippines had a strong RCA in PCAs (index value of 2.3). The comparisons of the ten largest exports of these economies further reveal a significant overlap between Malaysia, Singapore and Thailand.¹⁶

b) *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) have

¹⁴ 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 (Larsen, 1998).

¹⁵ We do not show the index for 1982 in Table 7.

¹⁶ The main products were Office Machines, Telecommunications, Switchgear and Electronic Components.

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” (p.21). It fails to capture direct product competition between regional economies with similar export structures.

Table 8 lists the top twenty exports of Singapore and Hong Kong at the SITC-3 digit level for 1999.¹⁷ 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.¹⁸ A further analysis of the top five exports at the SITC-3 digit level of both these economies to the Asia-5 economies and three other important regions, viz. the U.S., 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.¹⁹ 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 9 highlights the cross-country correlations of export structures at the three-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-hit economies (0.47).²⁰ 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.

4. Quantifying Trade Spillovers during the 1997-98 Financial Crisis

The preceding discussion has covered the nature and patterns of trade linkages between the Asia-5 economies and Hong Kong and Singapore. Our next objective is to quantify the economic impacts of a slowdown in the Asia-5 economies on Hong Kong’s and Singapore’s outputs via the trade channel.

This section is divided into two parts. First, we calculate the direct trade (complementary) effect index estimates *a la* Conway 2001 (see Appendix A). We are cognizant of the fact that this direct trade effect leaves out a number of third-country and other indirect trade effects that may be captured in a VAR

¹⁷ The pattern is almost similar for 1990 and 1995.

¹⁸ 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 Equipment (SITC 762 and SITC 763).

¹⁹ Petroleum Products Refined (SITC 334) is another important category of exports to all these countries.

²⁰ 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.

framework.²¹ Therefore, to supplement the direct trade effect index, the second sub-section will highlight some of the findings of Abeysinghe and Forbes (2001) on the cumulative effects, both direct and indirect effects, of output slowdowns in the five Asian economies on the GDPs of Hong Kong and Singapore.

a) *Direct Trade Effect*

Two steps are involved in the calculation of Conway's direct trade index. First we calculate the share of Hong Kong's and Singapore's exports to the Asia-5 economies in the overall former economies' GDPs in 1997. Second we compute the difference between the growth rates of the exports of the twin cities to each of the Asia-5 economies in 1997 and 1998. Multiplying the ratio from the first step with the percentage differences between the export growth rates (step two) we have an estimate of the direct-trade effects of export slowdowns to the Asia-5 economies on the GDPs of Hong Kong and Singapore.

Several interesting lessons may be unearthed from the Direct Trade Index during the pre-recession period (1997) and the peak period of the crisis (1998) (Table 10 and 11). The sharp slowdowns in the exports of the Asia-5 economies adversely affected Singapore's aggregate demand far more severely than it did Hong Kong. An average GDP contraction of nearly 2 per cent is found for Singapore, compared to less than 0.3 per cent for Hong Kong. This finding ought to be anticipated *a priori*. Although Hong Kong's exports contracted more in percentage terms, the shares of its exports to these crisis economies were small, roughly between 0.5 to 3 per cent. Together, the merchandise exports to Malaysia, the Philippines, Thailand and Korea constituted about one-third of Singapore's total merchandise exports, compared to less than 5 per cent for Hong Kong. Singapore's exports to Malaysia caused the most detrimental effect for Singapore's GDP. For Hong Kong, it was its exports to Korea that was most damaging to the former's growth. Interestingly, the slowdown in the Philippines during the recent crisis seems to have had relatively more unfavourable impacts on Singapore and Hong Kong than did the slowdown in Thailand. With its very small share, the sharp fall in exports of Hong Kong to Indonesia did not have much of an impact on Hong Kong. Exports of Hong Kong to Singapore and of Singapore to Hong Kong have had significant direct effects on each other's outputs. Singapore's exports to Hong Kong, which grew at 24 per cent in 1997, contracted by 12 per cent in 1998. Hong Kong's exports to Singapore contracted by 7 per cent in 1997 and another 21 per cent in 1998. However, Singapore was far more adversely affected by the downturn in Hong Kong than vice versa.

b) *Multiplier Effects: Direct and Indirect Effects*

The preceding conclusion is consistent with the empirical findings of Abeysinghe and Forbes (2001) who apply a structural vector cointegration framework that transforms an export matrix (capturing both direct and indirect trade linkages) to output multipliers (impulse responses for one to three years after the shock) on data at a quarterly frequency. What are these multiplier effects? As an example, a recession

²¹ A primary advantage of using this index over the commonly used structural VAR model is that we can estimate the impact of changes in export growth rates on the aggregate demand in the local economy during particular years/short periods. In contrast, estimating a VAR model requires us to look at the whole of pre- and post-crisis periods in order to generate an adequate degree of freedom. Given the observation periods, it may be inaccurate to employ the results as a basis for the post-crisis period analysis only.

in Thailand affects Singapore's exports to the former directly; Thailand's imports from other countries are also impacted, reducing growth in these countries. Insofar as these economies source products from Singapore, its exports are also hurt indirectly. Thus, as Abeyasinghe and Forbes (2001) note, "even if bilateral linkages between two countries are weak, a shock to one country can have a significant effect on the other through the indirect impact on other countries' output" (p.4). Other things equal, the larger Thailand's global import volume the greater the multiplier effects. Direct trade matrices are unable to capture the multiplier or indirect effects. As such, the multipliers explain the interdependence across international borders better than export shares.

Examining the effects of a 1 unit negative shock in the Asia-5 economies, Singapore's normalised multiplier effect (impulse response) after one year is 1.36 units, and that of Hong Kong's is only about 0.57 (Table 12). In another words, the magnitude of Asia-5's multiplier effects for Singapore is more than twice as large as its extent for Hong Kong. Interestingly, Singapore's dependence on Hong Kong is relatively high (0.6) but not vice versa (0.2). This is consistent with the results from the Conway index above.

Overall, both the direct effects and the multiplier effects confirm that Hong Kong ought to have been less affected by the economic slowdown in the Asia-5 via the trade channel than Singapore.

5. 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. Taken as a whole, analyses of trade and real investment links suggest that underpinning the transmission of the regional shocks to Singapore was its close trade complementarities with the Asia-5 economies. 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 suggests 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.

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Table 1: Hong Kong and Singapore: Major Macroeconomic Indicators

	Annual Average				
	1990-95	1996	1997	1998	1999
<u>Hong Kong</u>					
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	1,618	n.a	n.a	n.a	n.a
Current a/c balance (US\$ mn.)	n.a	n.a	n.a	2,901	9,281
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
	Annual Average				
	1990-95	1996	1997	1998	1999
<u>Singapore</u>					
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 (S\$ mn.)	10,930	18,868	13,612	23,163	14,577
Current a/c balance (US\$ mn.)	7,327	13,898	16,912	21,025	21,254
Investment ratio ^a	35.5	36.8	39.3	32.8	32.8
Savings rate ^a	48.4	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: ^a International Monetary Fund, *International Financial Statistics Yearbook*, various issues.

^b Department of Statistics, Republic of Singapore, *Yearbook of Statistics*, various issues

Table 2: Changes in East Asian Exports 1971-1998 (in %)

	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
The 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
Korea					21.4	11.2	14.9	16.6
Malaysia					8.1	11.0	15.5	6.7
The Philippines					10.3	4.0	9.5	12.6
Singapore					16.1	11.3	13.1	2.4
Thailand					9.9	14.1	14.3	2.9
Dollar prices								
Hong Kong					11.5	1.3	2.1	-1.8
Indonesia					27.5	1.3	1.2	-3.1
Korea					10.8	2.5	0.1	-10.2
Malaysia					15.2	-1.5	4.6	-5.7
The Philippines					9.6	1.4	7.2	-8.6
Singapore					7.8	0.6	3.2	-2.4
Thailand					12.4	0.5	4.4	-4.6

Note: Data refer to national income account exports of goods and non-factor services.

The Philippines data for 1996-98 are for goods only.

Source: World Bank (2000)

Table 3: Trends in Hong Kong's Trade with Singapore and Other Crisis-Affected Countries (1991-99) (US\$ million)

Malaysia													
	Imports			Domestic Exports			Re-exports			Exports			Share of Re-exports in Total 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	
1991	1,269		1.27	292		0.98	418		0.61	711		0.72	58.87
1992	1,657	30.6	1.34	323	10.5	1.07	509	21.8	0.57	832	17.1	0.70	61.20
1993	2,050	23.7	1.48	332	2.8	1.15	569	11.7	0.53	901	8.3	0.67	63.15
1994	2,607	27.2	1.61	364	9.6	1.27	792	39.1	0.63	1,156	28.2	0.75	68.50
1995	3,723	42.8	1.93	335	-8.0	1.12	1,212	53.1	0.84	1,547	33.8	0.89	78.35
1996	4,395	18.1	2.21	323	-3.4	1.18	1,370	13.1	0.89	1,694	9.5	0.94	80.90
1997	4,909	11.7	2.35	347	7.1	1.27	1,374	0.3	0.85	1,721	1.6	0.91	79.86
1998	4,193	-14.6	2.27	235	-32.2	0.97	1,128	-17.9	0.75	1,363	-20.8	0.78	82.75
1999	3,868	-7.8	2.15	251	6.6	1.14	1,165	3.3	0.77	1,416	3.9	0.81	82.29
Indonesia													
	Imports			Domestic Exports			Re-exports			Exports			Share of Re-exports in Total 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	
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	1,265	37.4	0.78	162	-3.5	0.56	758	12.1	0.60	921	9.0	0.59	82.39
1995	1,633	29.1	0.85	206	27.2	0.69	856	12.8	0.60	1,062	15.3	0.61	80.58
1996	1,631	-0.1	0.82	202	-2.2	0.73	805	-6.0	0.52	1,006	-5.2	0.56	79.97
1997	1,669	2.4	0.80	153	-23.9	0.56	764	-5.1	0.48	917	-8.9	0.49	83.27
1998	1,812	8.5	0.98	87	-43.1	0.36	433	-43.3	0.29	521	-43.2	0.30	83.24
1999	1,533	-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			Share of Re-exports in Total 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	
1991	1,323		1.32	270		0.91	803		1.17	1,073		1.09	74.83
1992	1,526	15.3	1.24	288	6.6	0.95	771	-4.0	0.86	1,059	-1.4	0.89	72.81
1993	1,682	10.3	1.21	264	-8.1	0.92	756	-1.9	0.71	1,021	-3.6	0.75	74.09
1994	2,225	32.2	1.37	327	23.5	1.14	964	27.5	0.76	1,291	26.4	0.83	74.70
1995	2,728	22.6	1.42	346	6.0	1.16	1,269	31.7	0.88	1,615	25.2	0.93	78.58
1996	3,070	12.6	1.55	334	-3.5	1.22	1,475	16.2	0.96	1,809	12.0	1.00	81.53
1997	3,367	9.7	1.61	280	-16.1	1.03	1,587	7.6	0.99	1,867	3.2	0.99	85.00
1998	2,871	-14.8	1.56	206	-26.4	0.85	1,266	-20.2	0.85	1,473	-21.1	0.85	85.99
1999	2,939	2.4	1.64	173	-16.3	0.79	1,382	9.1	0.91	1,555	5.6	0.89	88.89

Cont'd Table 3

The Philippines

	Imports		Domestic Exports		Re-exports		Exports		Share of Re-exports in Total Exports
	Amount	Gr.(%)	Amount	Gr.(%)	Amount	Gr.(%)	Amount	Gr.(%)	
1991	383	0.38	278	0.93	638	0.93	916	0.93	69.68
1992	447	0.36	447	1.02	801	1.02	1,108	0.90	72.28
1993	518	0.37	293	1.02	1,043	0.98	1,336	0.99	78.10
1994	607	0.38	377	1.31	1,491	1.18	1,868	1.21	79.83
1995	862	0.45	377	1.26	1,632	0.94	2,009	1.16	81.23
1996	952	0.48	331	1.21	1,819	1.15	2,150	1.19	84.61
1997	1,268	0.61	354	1.30	1,855	2.0	2,209	1.17	83.98
1998	1,323	0.72	257	1.06	1,431	-22.9	1,688	-23.6	84.77
1999	1,586	0.88	286	1.30	1,454	1.6	1,740	3.1	83.55

Korea

	Imports		Domestic Exports		Re-exports		Exports		Share of Re-exports in Total Exports
	Amount	Gr.(%)	Amount	Gr.(%)	Amount	Gr.(%)	Amount	Gr.(%)	
1991	4,497	4.49	228	0.77	1,883	2.74	2,110	2.14	89.22
1992	5,704	26.8	183	0.60	1,755	1.97	1,938	1.62	90.57
1993	6,234	9.3	253	0.88	2,009	1.89	2,262	1.67	88.81
1994	7,447	19.5	273	0.95	2,133	1.69	2,406	1.55	88.65
1995	9,471	27.2	310	1.03	2,494	1.73	2,804	1.61	88.95
1996	9,478	0.1	337	1.23	2,598	1.69	2,935	1.62	88.51
1997	9,458	-0.2	302	1.11	2,494	-4.0	2,797	1.49	89.19
1998	8,887	-6.0	202	-33.3	1,580	-36.6	1,782	-36.3	88.68
1999	8,434	-5.1	193	-4.2	2,551	61.4	2,745	54.0	92.96

Singapore

	Imports		Domestic Exports		Re-exports		Exports		Share of Re-exports in Total Exports
	Amount	Gr.(%)	Amount	Gr.(%)	Amount	Gr.(%)	Amount	Gr.(%)	
1991	4,057	4.05	1,132	3.81	1,556	2.26	2,688	2.73	57.90
1992	5,050	24.5	1,338	4.43	1,791	2.01	3,130	2.62	57.24
1993	6,184	22.5	1,466	5.09	2,216	2.08	3,683	2.72	60.18
1994	8,018	29.7	1,582	7.9	2,633	2.09	4,214	2.72	62.47
1995	10,086	25.8	1,582	5.28	3,362	2.34	4,944	2.85	68.01
1996	10,537	4.5	1,294	4.72	3,670	2.39	4,965	2.75	73.93
1997	10,228	-2.9	1,085	-16.1	3,795	3.4	4,881	-1.7	77.76
1998	7,935	-22.4	659	-39.3	3,308	-12.8	3,967	-18.7	83.39
1999	7,736	-2.5	475	-28.0	3,701	11.9	4,176	5.3	88.64

Cont'd Table 3

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	Hong Kong, Total															
	Imports				Domestic Exports				Re-exports				Exports			
	Amount	Gr.(%)	Combined 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	Amount	Gr.(%)	Combined Share in Hong Kong Total	Share of Re-exports in Total Exports
1991	100,240		12.20	29,731	7.84	68,824	8.53	98,555	8.32	69.83						
1992	123,414	23.1	12.35	30,246	1.7	89,248	8.52	89,248	29.7	74.69						
1993	138,658	12.4	12.68	28,831	-4.7	106,420	6.83	135,252	13.2	78.68						
1994	161,833	16.7	13.70	28,737	-0.3	126,148	6.95	154,885	14.5	81.45						
1995	192,755	19.1	14.79	29,946	4.2	143,807	7.53	173,753	12.2	82.77						
1996	198,543	3.0	15.14	27,431	-8.4	153,313	7.66	180,744	4.0	84.82						
1997	208,612	5.1	14.81	27,307	-0.5	160,750	7.38	188,056	4.0	85.48						
1998	184,510	-11.6	14.64	24,331	-10.9	149,664	6.11	173,995	-7.5	86.02						
1999	179,520	-2.7	14.54	21,990	-9.6	151,895	7.20	173,885	-0.1	87.35						

Source: Census and Statistics Department, Hong Kong, *Annual Review of Hong Kong External Trade*, various issues

Gr.: Indicates growth rate over the previous year

Combined Share refers to total shares of the crisis-affected countries listed above in Hong Kong's total.

Table 4: Trends in Singapore's Trade with Hong Kong and Other Crisis-Affected Countries (1991-99) (US\$ million)

Malaysia													
	Imports			Domestic Exports			Re-exports			Exports			Share of Re-exports in Total Exports
	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	
1991	10,062		15.22	3,947		10.33	4,872		23.48	8,819		14.95	55.2
1992	10,612	5.5	14.71	3,820	-3.2	9.38	4,115	-15.5	18.11	7,934	-10.0	12.51	51.9
1993	14,030	32.2	16.47	4,957	29.8	10.62	5,529	34.4	20.27	10,485	32.1	14.18	52.7
1994	16,760	19.5	16.37	8,792	77.4	15.17	10,252	85.4	26.64	19,044	81.6	19.74	53.8
1995	19,250	14.9	15.48	9,483	7.9	13.65	13,182	28.6	27.06	22,665	19.0	19.18	58.2
1996	19,721	2.4	15.02	9,432	-0.5	12.84	13,080	-0.8	25.38	22,512	-0.7	18.01	58.1
1997	19,900	0.9	15.03	9,427	-0.1	13.02	12,398	-5.2	23.58	21,824	-3.1	17.46	56.8
1998	15,686	-21.2	15.45	7,553	-19.9	11.93	9,177	-26.0	19.73	16,730	-23.3	15.24	54.9
1999	17,276	10.1	15.56	8,278	9.6	12.06	10,698	16.6	23.26	18,976	13.4	16.55	56.4
Thailand													
	Imports			Domestic Exports			Re-exports			Exports			Share of Re-exports in Total Exports
	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	
1991	2,101		3.18	2,598		6.80	1,107		5.34	3,705		6.28	29.89
1992	2,680	27.6	3.71	2,555	-1.7	6.27	1,400	26.4	6.16	3,955	6.7	6.23	35.39
1993	3,513	31.1	4.12	2,460	-3.7	5.27	1,751	25.1	6.42	4,212	6.2	5.70	41.59
1994	4,891	39.2	4.78	2,694	9.5	4.65	2,665	52.2	6.92	5,359	27.3	5.56	49.73
1995	6,418	31.2	5.16	3,358	24.6	4.83	3,466	30.1	7.12	6,824	27.3	5.77	50.80
1996	7,175	11.8	5.46	3,235	-3.7	4.40	3,862	11.4	7.49	7,096	4.0	5.68	54.42
1997	6,789	-5.4	5.13	2,722	-15.9	3.76	3,025	-21.7	5.75	5,746	-19.0	4.60	52.64
1998	4,851	-28.5	4.78	2,112	-22.4	3.34	2,093	-30.8	4.50	4,205	-26.8	3.83	49.78
1999	5,244	8.1	4.72	2,533	20.0	3.69	2,503	19.6	5.44	5,036	19.8	4.39	49.70
The Philippines													
	Imports			Domestic Exports			Re-exports			Exports			Share of Re-exports in Total Exports
	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	
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	1,370	69.5	1.85	47.02
1994	781	55.2	0.76	838	15.4	1.45	740	14.9	1.92	1,578	15.2	1.64	46.91
1995	1,099	40.7	0.88	949	13.2	1.37	979	32.3	2.01	1,928	22.2	1.63	50.79
1996	1,390	26.5	1.06	1,082	14.0	1.47	1,215	24.1	2.36	2,296	19.1	1.84	52.90
1997	1,989	43.1	1.50	1,487	37.5	2.05	1,464	20.5	2.78	2,951	28.5	2.36	49.61
1998	2,391	20.2	2.36	1,202	-19.2	1.90	1,260	-14.0	2.71	2,462	-16.6	2.24	51.17
1999	2,935	22.7	2.64	1,310	8.9	1.91	1,519	20.6	3.30	2,829	14.9	2.47	53.70

Cont'd Table 4

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	Korea												
	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	Share of Re-exports in Total Exports
1991	1,876		2.84	851		2.23	542		2.61	1,394		2.36	38.91
1992	2,375	26.6	3.29	848	-0.4	2.08	579	6.7	2.55	1,427	2.4	2.25	40.56
1993	2,741	15.4	3.22	1,211	42.8	2.60	847	46.4	3.11	2,058	44.2	2.78	41.16
1994	3,919	43.0	3.83	1,316	8.6	2.27	1,218	43.8	3.17	2,534	23.1	2.63	48.08
1995	5,399	37.8	4.34	1,710	30.0	2.46	1,533	25.8	3.15	3,243	28.0	2.74	47.27
1996	4,512	-16.4	3.44	2,141	25.2	2.91	1,655	8.0	3.21	3,796	17.1	3.04	43.60
1997	4,079	-9.6	3.08	1,864	-13.0	2.57	1,829	10.5	3.48	3,693	-2.7	2.95	49.53
1998	3,040	-25.5	2.99	1,207	-35.2	1.91	1,357	-25.8	2.92	2,564	-30.6	2.34	52.92
1999	4,167	37.1	3.75	1,731	43.4	2.52	1,825	34.5	3.97	3,556	38.7	3.10	51.32
	Hong Kong												
	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	Amount	Gr.(%)	Share in Singapore Total	Share of Re-exports in Total Exports
1991	1,988		3.01	2,780		7.27	1,473		7.10	4,253		7.21	34.63
1992	2,202	10.8	3.05	3,178	14.3	7.80	1,783	21.1	7.85	4,961	16.6	7.82	35.94
1993	2,685	22.0	3.15	4,159	30.9	8.91	2,255	26.5	8.27	6,414	29.3	8.67	35.16
1994	3,461	28.9	3.38	5,136	23.5	8.86	3,253	44.2	8.45	8,389	30.8	8.70	38.78
1995	4,107	18.7	3.30	5,910	15.1	8.51	4,216	29.6	8.65	10,126	20.7	8.57	41.63
1996	4,200	2.3	3.20	6,764	14.5	9.21	4,361	3.4	8.46	11,125	9.9	8.90	39.20
1997	3,893	-7.3	2.94	7,096	4.9	9.80	4,925	12.9	9.36	12,020	8.0	9.62	40.97
1998	2,844	-27.0	2.80	5,210	-26.6	8.23	4,003	-18.7	8.61	9,212	-23.4	8.39	43.45
1999	3,186	12.0	2.87	5,213	0.1	7.60	3,586	-10.4	7.80	8,799	-4.5	7.68	40.76
	Singapore												
	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	66,102		24.66	38,222		27.64	20,751		39.94	58,974		31.97	35.19
1992	72,150	9.1	25.21	40,723	6.5	26.53	22,722	9.5	36.45	63,446	7.6	30.08	35.81
1993	85,161	18.0	27.56	46,661	14.6	28.96	27,280	20.1	40.42	73,941	16.5	33.19	36.89
1994	102,391	20.2	29.12	57,962	24.2	32.39	38,492	41.1	47.10	96,453	30.4	38.26	39.91
1995	124,395	21.5	29.16	69,476	19.9	30.82	48,711	26.5	47.99	118,187	22.5	37.89	41.22
1996	131,332	5.6	28.17	73,465	5.7	30.84	51,547	5.8	46.90	125,012	5.8	37.46	41.23
1997	132,411	0.8	27.68	72,424	-1.4	31.20	52,585	2.0	44.96	125,008	-0.0	36.99	42.06
1998	101,496	-23.3	28.39	63,287	-12.6	27.31	46,513	-11.5	38.46	109,801	-12.2	32.03	42.36
1999	110,998	9.4	29.56	68,628	8.4	27.78	45,997	-1.1	43.77	114,625	4.4	34.19	40.13

Source: Singapore Trade Development Board, Singapore Trade Statistics, various issues

Note: Singapore's TDB data excludes trade with Indonesia

Combined Shares refers to the share of the above crisis-affected countries in Singapore's total

Gr.: Indicates growth rate over the previous year

Table 5a: Singapore: Inward Stock of Foreign Direct Investment by Country of Origin (US\$ billion)

	1987	1992	1995	1997	1987	1992	1995	1997	1987-92	1992-95	1995-97
		Amount		Amount		Shares in Total		Shares in Total	C.A.G.R	C.A.G.R	C.A.G.R
U.S.	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
The 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 denotes the compound annual growth rate

Table 5b: Singapore: Stock of Foreign Direct Equity Investment Abroad by Host Country (US\$ billion)

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

Source: Calculated from Yearbook of Statistics, Singapore, various issues

Note: C.A.G.R denotes the compound annual growth rate

Table 6a: Hong Kong Total Value of Net Assets at Historical Costs Attributed to Inward Foreign Direct Investment by Country (US\$ billions)

Country	Amount						Share in Total			Growth Rate (%)		
	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	
U.K.	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	28.0	19.2	19.2	17.6	16.5	11.0	16.8	25.6	
U.S.	11.2	12.0	16.1	21.0	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 6b: Hong Kong Overseas Direct Investment in Selected Economies As of May 1997 (in 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	2.0	End-1996	3rd
Vietnam	3.1	End-1996	3rd
The Philippines	0.7	End-1996	3rd
Singapore	2.7	End-1992	4th
South Korea	0.7	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	0.7	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

Table 7: An Analysis of Aggregate Export Revealed Comparative Advantage (XRCA) among Hong Kong, Singapore and Other Crisis-Affected Countries according to Garnaut and Anderson Classification of Products by Relative Factor Intensities

Unskilled Labour Intensive Goods		1982	1987	1992	1996	Physical Capital Intensive Goods		1982	1987	1992	1996
Countries	RCA					Countries	RCA				
Hong Kong	RCA >1	7.09	4.48	3.81	3.54	Hong Kong	RCA >1	-	-	-	-
	RCA <1	-	-	-	-		RCA <1	0.29	0.34	0.47	0.52
Singapore	RCA >1	-	-	-	-	Singapore	RCA >1	-	-	-	-
	RCA <1	0.82	0.81	0.64	0.43		RCA <1	0.67	0.54	0.69	0.62
Indonesia	RCA >1	-	-	1.88	1.73	Indonesia	RCA >1	-	-	-	-
	RCA <1	0.10	0.57	-	-		RCA <1	0.11	0.20	0.17	0.24
Korea	RCA >1	4.97	3.70	2.94	2.25	Korea	RCA >1	-	-	-	-
	RCA <1	-	-	-	-		RCA <1	0.59	0.53	0.69	0.68
Thailand	RCA >1	1.60	2.04	2.08	1.97	Thailand	RCA >1	-	-	-	-
	RCA <1	-	-	-	-		RCA <1	0.37	0.20	0.30	0.39
Malaysia	RCA >1	-	-	-	-	Malaysia	RCA >1	-	-	-	-
	RCA <1	0.28	0.37	0.77	0.73		RCA <1	0.48	0.19	0.35	0.37
The Philippines	RCA >1	1.62	1.16	1.36	1.54	The Philippines	RCA >1	-	-	-	-
	RCA <1	-	-	-	-		RCA <1	0.19	0.35	0.17	0.15
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Technology Intensive Goods		1982	1987	1992	1996	Human Capital Intensive Goods		1982	1987	1992	1996
Countries	RCA					Countries	RCA				
Hong Kong	RCA >1	1.45	1.16	1.07	1.18	Hong Kong	RCA >1	1.07	-	-	-
	RCA <1	-	-	-	-		RCA <1	-	0.64	0.62	0.62
Singapore	RCA >1	1.54	2.15	2.56	2.69	Singapore	RCA >1	-	-	-	-
	RCA <1	-	-	-	-		RCA <1	0.43	0.33	0.34	0.35
Indonesia	RCA >1	-	-	-	-	Indonesia	RCA >1	-	-	-	-
	RCA <1	0.05	0.05	0.23	0.44		RCA <1	0.02	0.06	0.18	0.35
Korea	RCA >1	1.06	1.16	1.40	1.54	Korea	RCA >1	1.42	-	-	1.19
	RCA <1	-	-	-	-		RCA <1	-	0.93	0.89	-
Thailand	RCA >1	-	-	1.15	1.23	Thailand	RCA >1	-	-	-	-
	RCA <1	0.47	0.59	-	-		RCA <1	0.18	0.30	0.42	0.51
Malaysia	RCA >1	-	-	1.45	1.45	Malaysia	RCA >1	-	-	-	-
	RCA <1	0.55	0.65	-	-		RCA <1	0.05	0.09	0.29	0.32
The Philippines	RCA >1	-	-	-	2.42	The Philippines	RCA >1	-	-	-	-
	RCA <1	0.27	0.20	0.91	-		RCA <1	0.07	0.09	0.10	0.16

$$XRCA = \frac{X_i^k / X_w^k}{X_i / X_w}$$

$$= \frac{X_i^k / X_i}{X_w^k / X_w}$$

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
 X_w = Total World Exports

Table 8: 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 Clothings 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

N.B: 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 issues

Table 9: Correlation of East Asian Manufactured Export Structures, 1985 and 1995

Economy	Hong Kong	Indonesia	Korea	Malaysia	The Philippines	Singapore
Indonesia	0.172					
Malaysia	0.432	0.183	0.737			
The Philippines	0.512	0.218	0.664	0.823		
Singapore	0.367	0.078	0.667	0.749	0.620	
Thailand	0.547	0.217	0.524	0.597	0.581	0.705

Source: World Bank (2000)

Table 10: Direct Trade Effect of East Asian Economic Slowdowns in 1998 on Hong Kong's Economy

Hong Kong's Merchandise Exports as % Share in Hong Kong's GDP (in 1997)		Pre-Slowdown Period 1997		Slowdown Period 1998	
Case A: To Malaysia	0.99%	Export growth rate -4.32%	Malaysia's GDP growth rate 7.54%	Export growth rate -21.90%	Malaysia's GDP growth rate -7.50%
					Direct impact to Hong Kong economy 0.17%
Case B: To the Philippines	1.27%	Export growth rate -3.10%	The Philippines' GDP growth rate 5.16%	Export growth rate -25.20%	The Philippines' GDP growth rate -0.54%
					Direct impact to Hong Kong economy 0.28%
Case C: To Thailand	1.07%	Export growth rate -3.20%	Thailand's GDP growth rate -1.75%	Export growth rate -21.90%	Thailand's GDP growth rate -10.36%
					Direct impact to Hong Kong economy 0.20%
Case D: To Korea	1.61%	Export growth rate -10.60%	Korea's GDP growth rate 5.01%	Export growth rate -37.10%	Korea's GDP growth rate -5.84%
					Direct impact to Hong Kong economy 0.43%
Case E: To Indonesia	0.53%	Export growth rate -14.50%	Indonesia's GDP growth rate 4.70%	Export growth rate -44.30%	Indonesia's GDP growth rate -13.20%
					Direct impact to Hong Kong economy 0.16%
Case F: To Singapore	2.80%	Export growth rate -6.80%	Hong Kong's GDP growth rate 8.91%	Export growth rate -20.50%	Hong Kong's GDP growth rate 0.25%
					Direct impact to Hong Kong economy 0.38%

Source: Author's own calculations

Table 11: Direct Trade Effect of East Asian Economic Slowdowns in 1998 on Singapore's Economy

Singapore's Merchandise Exports as % Share in Singapore's GDP (in 1997)		Pre-Slowdown Period 1997		Slowdown Period 1998		
Case A: To Malaysia	22.90%	Export growth rate 2.04%	Malaysia's GDP growth rate 7.54%	Export growth rate -12.60%	Malaysia's GDP growth rate -7.50%	Direct impact to Singapore economy 3.35%
Case B: To the Philippines	4.80%	Export growth rate 35.15%	The Philippines' GDP growth rate 5.16%	Export growth rate -4.45%	The Philippines' GDP growth rate -0.54%	Direct impact to Singapore economy 1.90%
Case C: To Thailand	6.04%	Export growth rate -14.30%	Thailand's GDP growth rate -1.75%	Export growth rate -16.90%	Thailand's GDP growth rate -10.36%	Direct impact to Singapore economy 0.16%
Case D: To Korea	3.90%	Export growth rate -17.60%	Korea's GDP growth rate 5.01%	Export growth rate -20.60%	Korea's GDP growth rate -5.84%	Direct impact to Singapore economy 0.12%
Case E: To Hong Kong	11.70%	Export growth rate 23.60%	Hong Kong's GDP growth rate 5.26%	Export growth rate -12.40%	Hong Kong's GDP growth rate -5.13%	Direct impact to Singapore economy 4.20%

Source: Authors' own calculations

Table 12: Trading Partners Ranked by Export Shares and Output Multipliers^a

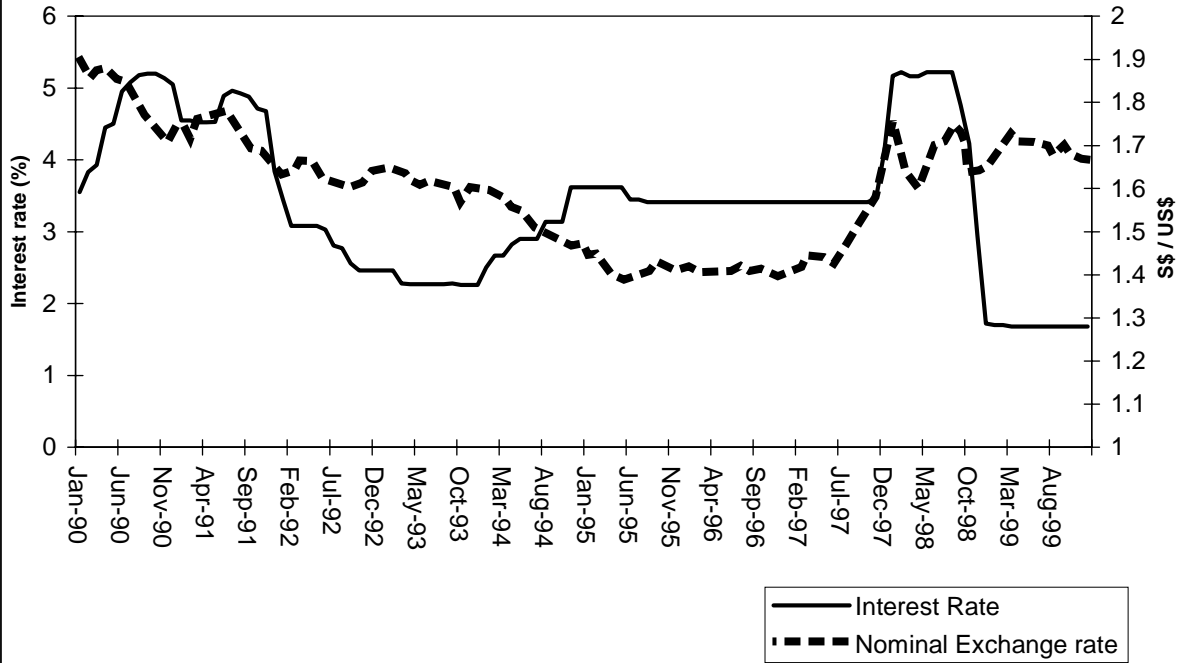
Hong Kong				Singapore			
Rank by Exports		Rank by Multiplier		Rank by Exports		Rank by Multiplier	
China	0.34	China	0.34	U.S.	0.18	ROECD ^b	1.11
U.S.	0.21	U.S.	0.21	Malaysia	0.18	U.S.	0.79
ROECD ^b	0.19	ROECD ^b	0.19	ROECD ^b	0.16	Japan	0.64
Japan	0.07	Japan	0.07	Hong Kong	0.09	Hong Kong	0.42
Singapore	0.03	Singapore	0.03	Japan	0.08	Malaysia	0.36
Korea	0.02	Korea	0.02	Thailand	0.08	China	0.28
The Philippines	0.01	The Philippines	0.01	Korea	0.06	Korea	0.24
Thailand	0.01	Thailand	0.01	China	0.03	Taiwan	0.18
Taiwan	0.01	Taiwan	0.01	Indonesia	0.02	Thailand	0.16
Malaysia	0.01	Malaysia	0.01	Taiwan	0.02	Indonesia	0.15
Indonesia	0.01	Indonesia	0.01	The Philippines	0.02	The Philippines	0.09

Note: a) Output Multipliers are based on the cumulative impulse response after four quarters (see source for details of computation). Multipliers are normalised by setting "own country" multipliers to unity. Export shares are based on the 1996 export matrix.

b) OECD Economies excluding the U.S. and Japan

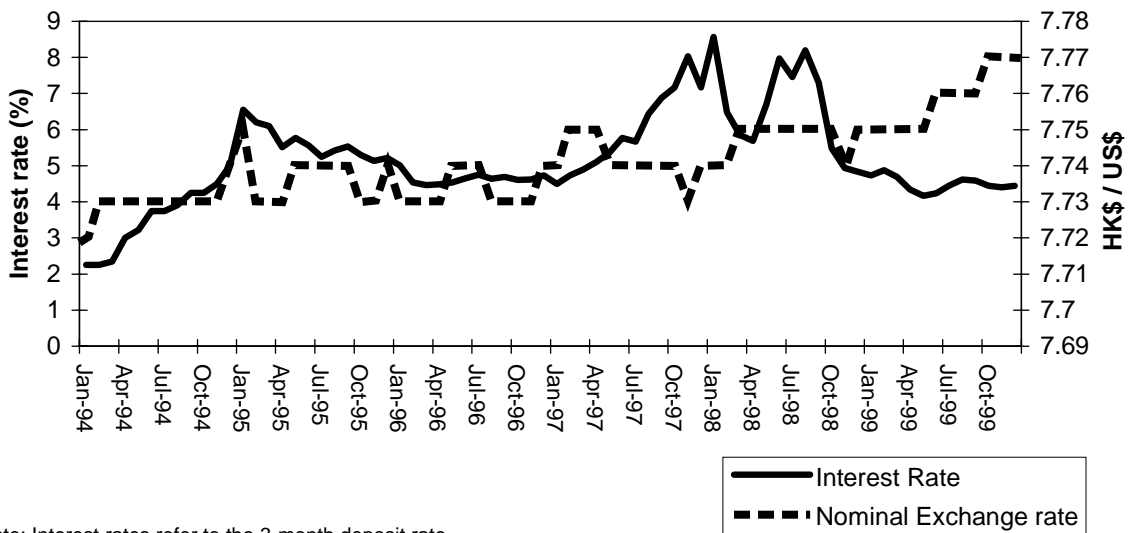
Source: Abeyasinghe and Forbes (2001)

Chart 1
Singapore: Nominal Exchange Rate and Interest Rate



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

Appendix A: The Direct Trade Effect Index

The Direct effect of an economic slowdown in the Asia-5 economies on the exports of Hong Kong and Singapore to the former countries can be calculated in the following manner (Conway, 2001):

$$\Delta X^{HK/SG} = X_0^{HK/SG} \left(\dot{X}_S^{HK/SG} - \dot{X}_{NS}^{HK/SG} \right) \quad (A1)$$

Δ denotes the first difference of the log forms of the variables. The above measures the change in Hong Kong's/Singapore's exports to Asia-5, where $X_0^{HK/SG}$ denotes exports from Hong Kong/Singapore to Asia-5 in period 0, and $\left(\dot{X}_S^{HK/SG} - \dot{X}_{NS}^{HK/SG} \right)$ denotes the difference in the growth rate of exports in the event of a slowdown (denoted by subscript "S") and a non-slowdown (denoted by subscript "NS").

The effect of exports to Asia-5 on Hong Kong's/Singapore's GDP growth is given by

$$\Delta \dot{Y} = \left(\frac{Y_1 - \Delta X^{HK/SG} - Y_0}{Y_0} \right) - \left(\frac{Y_1 - Y_0}{Y_0} \right) \quad (A2)$$

where Y_0 denotes Hong Kong/Singapore's GDP in period 0 and Y_1 denotes the same in period 1. Substituting (A1) in (A2), one gets

$$\Delta \dot{Y} = - \frac{X_0^{HK/SG}}{Y_0} \left(\dot{X}_S^{HK/SG} - \dot{X}_{NS}^{HK/SG} \right)$$

which implies that the impact of a slowdown of Hong Kong's/Singapore's exports to Asia-5 depends on the differences in the growth rate of exports between a slowdown and a non-slowdown period, weighted by the shares of Hong Kong's/Singapore's exports to Asia-5 in Hong Kong's/Singapore's GDP. Thus, this measure shows that the higher the share of Hong Kong's/Singapore's exports to its trading partners (Asia-5), the more adverse the impact of a slowdown in regional growth on Hong Kong's/Singapore's GDPs.