THE "TWIN CITIES" AND THE EAST ASIAN CRISIS: HONG KONG, SINGAPORE AND TRADE SPILLOVERS

by

Ramkishen S. <u>Rajan</u>[a], Rahul <u>Sen</u>[b] and Reza <u>Siregar</u>[c]

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a)   School of Economics, University of Adelaide, Australia and Hong Kong Institute for Monetary Research (HKIMR). E-mail: ramkishen.rajan@adelaide.edu.au. (*Corresponding author*).

b)   Department of Economics, National University of Singapore. E-mail: ecssenr@nus.edu.sg

c)   Department of Economics, National University of Singapore. E-mail: ecsrys@nus.edu.sg

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Contents

1.   Introduction

Comparative studies between Hong Kong and Singapore have usually generated keen interest, both because of the obvious commonalties between the two economies, but also because of their pointed differences. On the one hand, both these Asian economies are extremely small and highly open and have undergone rapid structural changes to higher value-added activities. They are both important regional financial centers and commercial hubs with extensive trade and investment links with the rest of the Asia and Pacific region. Given these similarities, the two economies are often dubbed the "twin cities". On the other hand, among the most apparent difference between the two economies is the manner in which they manage their respective exchange rate policies. While both economies share fairly high degrees of internal flexibility, Singapore pursues a relatively flexible but rather non-transparent exchange rate arrangement, i.e. a type of monitoring band *a la* Williamson (1998), with the parity being based on a trade-weighted currency basket. In marked contrast, the Hong Kong dollar is rigidly pegged to the US dollar via a currency board arrangement (see Annex 1).

Notwithstanding some concerns about longer term growth sustainability due to low total factor productivity (TFP) growth, especially in Singapore (for instance, see Young, 1995 and Hsieh, 2000), it has generally been acknowledged that both these economies had in place strong macroeconomic fundamentals and robust financial systems with solid prudential regulations. The strengths of these two economies vis-à-vis the rest of the regional economies are broadly illustrated in Table 1, which is borrowed from Goldstein and Hawkins (1998). It is fairy clear that, by most counts, Thailand had the worst "fundamentals" (Rajan, 2001a). It was followed by Indonesia, which was the most severely impacted by the East Asian crisis of 1997-98. Hong Kong and Singapore, which appear to have had the best fundamentals, were the least affected. Malaysia and the Philippines were somewhere "in between".

Despite their apparent strengths both Hong Kong and Singapore did, nonetheless, suffer from the regional crisis. The fact that even relatively healthy economies can be and have been

affected by weaknesses in neighboring economies has generated a great deal of research interest on the issue of "contagion". This term is quite apt; like a spreading virus, agents with the weakest immune system to begin with are the ones most severely impacted. The literature on the East Asian crisis and contagion has concentrated almost exclusively on the five crisis-hit economies of Indonesia, Korea, Malaysia, Thailand and the Philippines (Asia-5 economies). In contrast, we focus squarely on Hong Kong and Singapore.

It is important to specify at the outset the scope of the study. We make no attempt to provide a full discussion of the causes of specific speculative attacks on the two economies and their aftermath. Neither do we enter the debate of the precise definitions of the term "contagion". The relevant literature has hitherto been unable to converge on a standard definition (Claessens, et al., 2001 and Forbes and Rigobon 2001). We merely follow Abeysinghe and Forbes (2001) in defining contagion rather broadly as "the spread of recessionary impulses across borders". Accordingly, this study takes an eclectic approach, examining the relative importance of various trade-related channels in transmitting the regional downturn from the Asia-5 economies to Hong Kong and Singapore. This rather modest goal is realized through a detailed analysis of trading patterns, supplemented, where necessary, by a selective review of recent empirical studies. We focus on the trade channel in recognition of the fact that both Hong Kong and Singapore are important regional trading and commercial hubs. This emphasis is further motivated by Glick and Rose (1999) who note:

> 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)[1].

The remainder of this study is structured as follows. The next section discusses the macroeconomic and financial conditions of Hong Kong and Singapore prior to the crisis (1992-

96), describes the lead up to the speculative attacks on the Hong Kong and Singapore dollars (1997-98), and highlights the consequences and policy responses thereof. In order to clarify the exposition, section 3 defines and highlights the various transmission channels of crises across countries. A distinction is made between propagation channels that are related to investor sentiment or psychology (termed "pure contagion"), on the one hand, and linkages between economies that are measurable/observable *ex-ante*, on the other. The latter is referred to as "spillovers" or "fundamentals-based contagion"[2]. The center of attention of this study is on trade spillovers. Section 4 deals with trade complementarities, examining Hong Kong's and Singapore's trade and investment linkages with the Asia-5 economies. Section 5 undertakes a formal empirical analysis to test the statistical and quantify the economic significance of the demand/export-induced trade spillover channel. Section 6 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. Section 7 concludes with a summary and evaluation. Three annexes follow the main text. The first provides a brief overview of exchange rate regimes in Hong Kong and Singapore. The second and third describe the trade indices used in sections 4 to 6.

[1] In a pioneering study, Eichengreen et al. (1996) emphasized this channel for industrial countries. Forbes (2001) reviews the Glick and Rose (1999) study as well as other theoretical and empirical studies on trade contagion. None have focused specifically on Hong Kong and Singapore.

[2] 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). In a recent study using a comprehensive data set of financial statistics, product information, geographic data, and stock returns involving 14,000 companies in 46 economies, Forbes (1999) found all the above transmission mechanisms were important in the case of the East Asian crisis, particularly the product competitiveness channel. *A priori*, it is surprising that the common creditor/credit crunch effect (through banks) was not found to be as important. This may be explained by the fact that Forbes focused on *international* rather than *regional* propagation and did not explicitly test for the herding channel. Kaminsky and Reinhart (2000b) and Van Rijckeghem and Weder (1999) have concluded that the bank lender channel was particularly important in the East Asian crisis, though the

2.   Economic Performance of Hong Kong and Singapore in the 1990s

This section is sub-divided into three parts. The first part examines the pre-crisis macroeconomic and financial performance of Hong Kong and Singapore in the first half of the 1990s. The aim is to gauge the health of the two economies pre-crisis and highlight any possible areas of concern. This is followed by a brief discussion of the crises scenarios in both economies (1997-98), a summary of steps taken by both countries in response to the crises, as well as the dynamics of their post-crisis economic recoveries.

2.1   Pre-crisis Macroeconomic and Financial Performance

a)   Macroeconomic Indicators

Tables 2a,b summarize some key macroeconomic indicators in Hong Kong and Singapore respectively for the period 1992 and 1996.

Both economies enjoyed robust growth during this period, real GDP expanding annually by 5.5 percent in Hong Kong and 9 percent in Singapore. This ensured that open unemployment was kept very low in both cities (under 3 percent). Economic growth was largely investment-led, investment to GDP ratios averaging over 30 percent in both economies[3]. These high investment ratios were, however, not translated into external imbalances as national savings remained high in both economies due to a combination of high domestic savings and disciplined management of public finances. This was particularly true in the case of Singapore, where the gross domestic savings (GDS) to GDP ratio stood at almost 50 percent and the overall budget balance was about 12 percent[4]. This resulted in an average current account surplus of about 10 percent of GDP

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inclusion of a trade competition variable tends to dilute the significance, due possibly to the high correlation between competition for funds and trade (also see fn 15).

[3] Rodrik (1995) has emphasized the importance of investment booms in East Asia as being the cornerstone of the region's hugely successful export-led growth strategies pre-crisis.

[4] The concern in Singapore has in fact been about whether the city-state has been "over-saving" and "over-investing" (Kasa, 1997).

during the period under consideration. In the case of Hong Kong, the GDS to GDP ratio was slightly over 30 percent and the fiscal balance remained more or less in balance (registering a slight surplus of 1.6 percent). The overall current account was consequently also in balance. Unlike Singapore though, there were signs of a gradual deterioration in the savings-investment imbalance. While Hong Kong's investment rate rose from under 30 percent in 1992 to peak at 35 percent in 1995, there was a simultaneous, albeit marginal, decline in the domestic savings ratio (from about 34 percent to 31 percent). In addition, Hong Kong's overall budget balance fell from a surplus of 2.8 percent in 1992 to register a deficit of 0.3 in 1995 before returning to a surplus in 1996. The rising domestic investment and savings imbalance was translated into a worsening current account balance position in Hong Kong in the late 1980s and early 1990s; the external balance moved from a double-digit surplus to a deficit from 1994-95.

While data on capital flows to and from Hong Kong for the pre-crisis period are unavailable (this data has only been collected since 1998), in the case of Singapore, the private capital flows averaged 0.1 percent of GDP between 1992 and 1996, while official flows were negligible (Table 3). Foreign direct investment (FDI) dominated overall inflows, averaging 4.3 percent of GDP. In fact, despite its miniscule geographic size, Singapore has accounted for about 2.5 percent of global FDI inflows worldwide in 1994-97 (UNCTAD, *World Investment Report*, various year). Net portfolio flows and "other" net investment flows were about -2 percent of GDP each. This category includes short- and long-term credits, including use of IMF credit, as well as currency and deposits and other accounts receivable and payable. The net outflows from the other two categories are consistent with Singapore's role as a net creditor nation. This contrasts sharply with some of the other Asia-5 economies, Thailand in particular, where pre-crisis inflows were dominated by short-term bank lending (Rajan, 1999, 2001a). The large current account surpluses in Singapore led to a rapid and sizeable accumulation of foreign exchange reserves (US$ 77 billion in 1996); Singapore had one of the highest per capita reserve holdings in the world. Hong Kong too accumulated a large amount of reserves, almost US$64 by 1996. While both economies

had accumulated some external debt, the levels of indebtedness were far below most other developing economies, about 25 percent of GDP in the case of Hong Kong in 1996 and about 10 percent of GDP in the case of Singapore. More importantly, the bulk of the external debt was long-term in nature (Tables 2a,b). In 1996, foreign reserves exceeded short-term debt by almost 40 times in the case of Singapore and about 5 times in the case of Hong Kong (ADB, 2000).

b)   *Monetary and Financial Indicators and Asset Markets*

Fiscal restraint was accompanied by equally disciplined monetary policy management, resulting in growth being relatively noninflationary, particularly in Singapore, where consumer prices rose an average of 2.3 percent compared to about 8 percent in Hong Kong. Broad money supply, defined here as M2, grew 10 percent in Singapore and 13 percent in Hong Kong. More importantly, the M2 to GDP and the M2 to international reserves ratios gradually fell in both economies in the five years under analysis; though the former was on the high side (as was its credit to GDP ratio). The latter variable is particularly significant as the ratio of M2 to international reserves is the inverse of the degree to which liquid domestic liabilities of the banking system are supported by foreign reserves. There is a large body of empirical evidence which has stressed that a high and growing M2 to reserves ratio is an early warning indicator of impending monetary and financial difficulties (Kaminsky and Reinhart, 1999, Rodrik and Velasco, 1999 and Sachs et al., 1996).

Weak financial institutions have been the Achilles heals of the Asia-5 economies. As with the rest of the region, two potential areas of some concern in the twin cities were the relative opaqueness of Singapore banks and high exposures of Hong Kong and Singapore banks to the property markets. This notwithstanding, by all indicators, the banking systems in both Singapore and Hong Kong have been quite well managed and supervised with generally solid risk

management[5]. The capital adequacy ratio in Singapore was 12 percent, in contrast to the norm of 8 percent which Hong Kong adhered to (Table 4); though risk adjusted ratios were far higher (Claessens and Glaessner, 1997, 1998). More generally, by all counts - be it efficiency or cost ratios; degree of riskiness or financial fragility; levels of institutional development - financial systems in Hong Kong and Singapore far outperformed those in the Asia-5 economies and were, by and large, viewed as being quite solid and stable. In addition, unlike the Asia-5 economies, corporates in Hong Kong and Singapore were not highly leveraged (Table 5).

Being important commercial hubs with concentrated urban populations, real estate has always been considered a highly valued commodity in both cities. Consequently, speculative boom and busts have impacted both (see Mera and Renaud, eds., 2000). In the case of Singapore, concerns about overheating following sharp appreciation in property price indices in the early 1990s (prices tripling between mid-1990 and mid-1996) led to the imposition of restrictions by the government (Koh and Cuervo, 2000). This kept prices fairly subdued in 1996-97 (Figure 1). Asset price appreciation appeared to be of more concern in the case of Hong Kong, where there was a sharp run up in property and equity prices between end 1995 and mid 1997, partly due to a surge in funds from China. P.R.C. prior to the handover of the city to the Mainland. By mid-1997, property prices in Hong Kong were a third higher than their trough in the second quarter of 1994. IMF estimates are that a residential property bubble of some 40-45 percent emerged in mid 1997 (Kalra et al., 2000). The Hong Kong Hang Seng index, which was 10,500 points in August 1996, peaked to over 16,800 points by August 1997 (Figure 2).

2.2   Crisis Scenario (1997-98)

a)   Exchange Rate Trends

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[5] If anything, in the case of Singapore, some concerns had been expressed pre-crisis that domestic financial institutions were being "overly cautious" and risk averse and prudential regulations a bit "too stifling". Accordingly, the authorities established a Financial Review Committee to recommend and oversee steps aimed at opening up the domestic financial sector to international cooperation. These recommendations have since been implemented, with the process of financial sector liberalization gathering pace in 2000 and 2001.

The inherent strengths of the two economies in the first half of the 1990s were reflected in their respective currency values. Between 1990 and 1996, the Singapore dollar (S$) appreciated gradually against the US$ from about 1.9 to about 1.4. The Hong Kong dollar's fixed parity with the US dollar (at HK$ 7.8 per US$) was also relatively untroubled. On average, Hong Kong experienced a stronger appreciation of the REER than the NEER. In contrast, the appreciation of Singapore's REER was outpaced by that of the NEER (Figure 3)[6]. One might have expected Hong Kong's export performance to lag behind that of Singapore's on the basis of these trends. In fact, overall merchandise export performance remained strong in both economies, growing at average annual rates of between 10 and 12 percent since the early 1980s (Figure 4). However, a contrasting trend emerges when total exports are decomposed into their two components of domestic exports and re-exports. Most of Hong Kong's exports were due to re-exports, particularly since 1990. The growth of domestic exports stagnated over the period 1990-995 and declined since 1996 (discussed in the next section). The rapid appreciation of Hong Kong's REER appears to have led to a steady erosion in the competitiveness of its domestic exports (Rajan and Siregar, 2000). In the case of Singapore, both domestic exports and re-exports contributed to the overall impressive performance of exports by the twin cities during the first half of the 1990s.

The nearly fifty percent nominal appreciation of the US dollar relative to the Japanese yen between June 1995 to April 1997 led to a rise in the value of the regional currencies relative to the yen (Figure 5). This in turn contributed to a marked appreciation of the REERs of most of the East Asian economies by end December 1996 and into mid 1997 over 1995[7]. A cyclical slow-down in regional export growth due, in large part, to a global glut in the semiconductor industry in 1996 and a sharp deterioration in the terms of trade, adversely affected Singapore, Hong Kong

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[6] An increasing trend in the REER and NEER implies an appreciation of the domestic currency. A stronger appreciation of the REER than the NEER implies that the domestic price level is rising faster than the prices of the major trading partner countries.

[7] To be precise, REER appreciations were experienced by the Southeast Asian economies only; South Korea's REER was relatively stable during the period under consideration (Rajan, 1999).

as well as the other regional economies (World Bank, 2000)[8]. This resulted in a complete stagnation of exports in Singapore; Hong Kong's export volume and value expanded modestly by 6.1 and 4.2 percent respectively in 1997. While Singapore's external balance recorded a huge surplus (18 percent of GDP), there was a further worsening of Hong Kong's current account balance (-3.6 percent). Nonetheless, growth for the whole of 1997 remained buoyant in both economies, Singapore growing at about 8 percent and Hong Kong 5 percent, while inflation remained largely subdued in both cases (Table 6a,b). Economic activity did, however, show signs of slowing in the latter half of 1997 following the crisis in Southeast Asia.

b)   *Dynamics of Speculative Attacks[9]*

As is well known, the Thai baht was devalued on July 2, 1997 following a series of speculative attacks and drain on international reserves (Rajan, 2001a). The crisis then spread swiftly to other Southeast Asian economies. The Philippine peso and the Malaysian ringitt were floated on July 11 and July 14 respectively, while the Indonesian rupiah began a rapid downward spiral following its floatation in August 14. After a short respite, there was an escalation of exchange market pressures in the region in October as a barrage "bad news" from the Southeast Asian economies - pertaining to the level of usable international reserves and solvency of banking systems - emerged. The Thai baht lost half of its value by mid October, the Indonesian rupiah lost two thirds of its value and the Malaysian ringgit, and the Philippine peso lost about one third of their respective values (Figure 5b). In what is often referred to as the second stage of the crisis, it

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[8] While dollar prices of all East Asian exports fell across the board, real export volumes declined by about 5 percent in the case of Hong Kong and Singapore in 1998, while remaining positive in the rest of East Asia. (World Bank, 2000). Duttagupta and Spilimbergo (2000) stress that this growth slowdown was specific to East Asia and cannot be explained by a worldwide demand slowdown. This is consistent with the analysis of the electronics demand cycle by Abeysinghe (2000) who finds that the 1996-97 slowdown was largely due to a region-specific cyclical downturn and not a structural weakness.

[9] The aim here is to highlight main aspects of the crisis scenarios, consequences and policy responses. No attempt is made to be comprehensive. For a chronicle of the East Asian crisis, see Kaminsky and Schmukler (1999), Gab-Je and Willett and others.

spread to the relatively more advanced regional economies which until then had been able to stave off currency market pressures.

Singapore

The Taiwanese authorities allowed their currency to float in October 17, leading to a depreciation of the New Taiwan dollar by about 6 percent. Against the backdrop, the Singapore dollar was allowed to float during the midst of the crisis. It promptly depreciated by 20 percent, reversing a persistently appreciating trend over the period prior to the crisis. The stock market was similarly impacted. The Straits Times (ST) Index which was over 2,200 in January 1997, fell precipitously, losing three fifths of its value to a ten year low of about 850 by September 1998. By the fourth quarter of 1998, the private residential property market index fell by 45 percent from its peak in mid 1996 (Figures 1 and 2). Singapore's capital and financial accounts experienced a sharp net outflow of funds in the second half of 1997 and particularly in 1998, mainly because of a withdrawal of foreign interbank funds. Specifically, there was a dramatic reversal in the flow of bank and other liabilities, from a net inflow of US$ 6.8 (S$ 9.5) billion in 1996 to an outflow of US$ 19.1 (S$ 31.8) billion in 1998 (Table 6b).

Hong Kong

While the Hong Kong dollar peg was spared from the spate of regional currency depreciations, its currency board arrangement did come under intense pressure in the third quarter of 1997, particularly in October of that year. An evolution of the probability and intensity of a Hong Kong dollar devaluation from February 1997 to December 1998 is instructive (Rzepkowski, 2000). The Thai baht's devaluation in July 1997 appeared to have negligible impact on Hong Kong, while the devaluation in mid August 1997 of the other Southeast Asian currencies, like the Indonesian rupiah, had a marginal influence on the intensity of Hong Kong dollar devaluation. It was the devaluation of the New Taiwan dollar that appeared to trigger the intense speculative pressures against the Hong Kong dollar. Interest rates during this period rose and forward premia on the Hong Kong dollar widened in the midst of strong pressures on the

exchange link (see section 2.4). These bearish pressures were successfully resisted with a combination of intervention in the foreign exchange market and a concomitant sharp hike in interest rates (Figure 6). This in turn contributed to a substantial decline in equity and property markets. By mid 1998, the stock and residential property price indices lost over half their respective values from the peaks in August 1997 (Figure 1). There were renewed speculative attacks in early to mid August 1998 as the Japanese yen hit an eight year low.

The Hong Kong Monetary Authority (HKMA) intervened in the equity spot and futures markets to repel these attacks on August 14, 1998. This intervention was meant to counter the so-called speculative "double market play", which involved hedge funds and other financial agents taking simultaneous short positions in both the equity market and the Hong Kong dollar. The share purchase by the Hong Kong authorities took place again in late August and early September, pushing the government's total bill to HK$118 billion (US$ 15.2 billion) or about 15 percent of international reserves. The intervention was successfully managed and helped calm financial markets, but not before the financial markets plummeted sharply, particularly in October 23 (dubbed "Black Thursday"). Following the intervention, the authorities took steps to strengthen the linked exchange rate and put in place an array of regulatory changes to enhance transparency and increase the cost of speculative activity in the stock and futures markets[10]. On September 6, 1998, the Hong Kong authorities announced a series of measures. These measures fall into three broad categories (Chiu, 2001 and HKMA, 1998): (a) an explicit commitment by the HKMA to purchase Hong Kong dollars and government bonds from any licensed currency dealer (as opposed to just the large banks) at a fixed rate of HK$7.75 to the US dollar, thus making the commitment to the link more explicit; (b) revamping the mechanism for providing liquidity assistance; and (c) enhancing the transparency of the currency board arrangement.

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[10] More precisely, Rzepkowski (2000) has concluded that "(a)ll the discretionary measures adopted by the HKMA to break this self-fulfilling speculative scheme proved to be at best ineffective and at worst counter productive, since they led to greater speculative pressures on the foreign exchange market. In contrast,

2.3   Economic Consequences of the Crisis and Policy Responses

Hong Kong's high interest rates and sharp contractions in equity and property prices in both economies inevitably had real consequences (Table 6a and Figure 7). Its overall GDP declined by 5.3 percent in 1998 and unemployment rose to 4.7 percent. Singapore's growth just about managed to stay in positive territory in 1998 (0.4 percent), a distinct contrast to the buoyant growth enjoyed in the first half of the 1990s. Unemployment in Singapore peaked at 4.5 percent. The output and employment growth performances of the two cities, while certainly disappointing by their historical experiences, were far less so when compared to the Asia-5 economies, where currency depreciations amounted to about 60 percent between mid-1997 and mid-1998 and growth collapsed by double digits (Figures 5 and 7b). While the Singapore dollar lost about one fifth its value vis-à-vis the US dollar in nominal terms between July 1997 and December 1998, it depreciated on a real effective basis, though by far less than the Asia-5 economies. Given the maintenance of Hong Kong's currency board link, the real effective rate appreciated perceptibly during this period (Figure 3).

From an expenditure perspective, the output declines in both economies were caused by a combination of dampened domestic demand and weak external demand. Exports, in US dollar terms, declined by 7 percent in Hong Kong in value terms (4 percent in volume terms) and 12 percent in the case of Singapore. Nevertheless, current account balances improved in both cases due to severe import compression, imports declining by 12 percent in Hong Kong in value terms (7 percent in volume terms) and 23 percent in the case of Singapore. The inevitable consequence of this import compression was a pointed decline in capital formation, with investment ratios declining from about 34 percent to 29 percent in Hong Kong, and from 39 percent in 1997 to 33 percent in 1998 in the case of Singapore.

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when the HKMA undertook reforms to introduce a more rule-based system in September 1998, it succeeded in dampening the pressures against the HK dollar".

In response to the crisis, the Hong Kong authorities eased fiscal policy, with the fiscal balance registering a deficit of 1.8 percent in 1998 following a surplus of 6.6 percent in 1997 (Chiu, 2001, HKMA, 2000a; and Table 6a)[11]. This was combined with job creation and retraining programs to alleviate the costly adjustments needed in the domestic economy. Fiscal policy was also eased in Singapore both in the 1998/99 (April/March) budget, as well as in the form of a package of supplementary measures (equivalent to 1½ percent of GDP). The primary operating surplus, which was 3.9 percent in 1997, was just in balance in 1998, more so due to a decline in revenues. In both economies, infrastructural projects were brought forward, corporate tax rebates and incentives were offered, and land sales were suspended.

Not being constrained by a rigidly linked exchange rate regime, monetary policy was expansionary in Singapore (Table 6b). The Singapore authorities used the crisis as an opportunity to push through cost measures to ensure that the city-state would be in competitive position post-crisis vis-à-vis neighboring economies[12]. These policies included a 10 percent reduction in the employers' contribution to the Central Provident Fund (a mandatory pension fund, voluntary wage reductions), cuts in nominal wages, government-controlled rentals for commercial and industrial properties and utility charges for electricity and telecommunications. Other structural policies by way of further deregulation of financial, telecommunications and other tradables services were also undertaken (MTI, 1998).

A detailed discussion of post-crisis dynamics of growth is well beyond the scope of this study. Suffice it to note that, as with the Asia-5 economies, both Singapore and Hong Kong experienced "V-shaped" recoveries (Figure 7). There was a rapid rebound in growth in 1999,

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[11] According to estimates by the Hong Kong Monetary Authority, the fiscal impulse has raised GDP growth by approximately 1.5 percent in FY 1998 and 1999 (Chiu, 2001 and HKMA, 2000a).

[12] As noted by the government-appointed Committee on Singapore's Competitiveness (CSC): "The regional crisis, which started in July 1997, has altered the economic landscape. The sharp currency realignments have eroded our cost competitiveness. Before the crisis, regional countries have expanded their infrastructure rapidly. With financial reform and economic restructuring, regional countries will

primarily due to a sharp pickup in external demand for semiconductors, telecommunication equipment and electronics in general. The recovery was reinforced by a combination of timely, decisive and generally supportive policy responses as noted above, as well as an across-the-board revival of confidence as financial markets registered strong gains. As noted above, disaggregation of growth by its components reveals that consumption (both private and public) and external demand were the main drivers in 1999 and 2000. Investment demand was negative in 1999 before recovering smartly in 2000. All in all, Hong Kong grew by about 3 percent in real terms in 1999 while Singapore expanded by 5.5 percent. This was followed by almost 10 percent growth surges in both economies in 2000.

2.4   Section Summary

The preceding discussion has underscored that both Hong Kong and Singapore have been dynamic economies, propelled by a combination of outward orientation, macroeconomic policy discipline and sound financial institutions. Prior to 1997, there were some concerns about an inflated asset markets in the case of Hong Kong, real exchange rate overvaluation in 1996 following the depreciation of the yen against the US, exacerbated by the plummeting regional currencies in 1997-98. However, in a recent authoritative study of currency crises in Mexico (1994-95) and East Asia, Nitithanprapas and Willett (2000) conclude that

> (w)hen considered independently in the regressions, the real exchange rate, the current account deficit and FDI, are significant only in some studies. When the three variables are combined together, however, they are significant in all of our regressions. Accordingly, we believe that the composite indicator of current account, FDI, and real exchange rate is a useful indicator of external vulnerability to financial contagion….(A)dequate foreign reserves in relation to liquid money or in relation to short-term external debts can help prevent an otherwise vulnerable country from suffering a crisis. Thus reserve management should be given a prominent place in countries' strategies for dealing with potential currency crisis (pp.35-6).

eventually recover and become even more competitive. We have to take decisive action to regain our competitiveness and strengthen our capabilities to prepare for future growth" (MTI, p.20).

Based on this, Hong Kong and Singapore ought to have been fairly immune to the regional crisis. Indeed, both economies were financially and structurally strong and not smarting from the problems that faced the other Asia-5 economies such as vulnerable corporate and financial sectors and large and unhedged short-term foreign debt. Yet both economies experienced sudden and sharp albeit short-lived recessions in 1998, a consequence of "contagion" from the Asia-5 economies (discussed in the next section). To reinforce this point, at least in the case of Hong Kong, the one month forward premium - which is the annualized percentage deviation of the forward exchange rate from the spot exchange rate - remained stable until July and August 1997 before jumping up only in November 1997 and then again in early 1998 and then the third quarter of that year (Figure 8)[13],

3. Trade Contagion: Definitions and Transmission Channels

While the East Asian crisis did threaten to turn global, it did not. Similarly, while the currencies of Thailand, Hong Kong and the Philippines underwent brief periods of speculative attacks during the Tequila crisis, the crisis predominantly affected Mexico's neighboring economies. 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 Asian crisis, De Gregario and Valdes (2001) 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. Other recent empirical studies confirming this regional dimension of currency crises include Calvo and Reinhart (1996), Frankel and Schmukler (1996), Glick and Rose (1999) and Kaminsky and Reinhart (2000a).

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[13] While not shown here, a comparison of premia over longer-run reveal that the 12-month premia since late 1997 by and large exceeded the 6-month premia which in turn exceeded shorter-term premia. This may suggest that there were market concerns about the longer-term durability of the HK peg as compared to short-term.

As noted, we do not intend on entering into a discussion of the exact meaning and definition of the term "contagion". Masson (1998) provides a sufficiently general but appropriate definition by referring to contagion as a situation where a currency crisis in one economy leads to a jump to a "bad" equilibrium in a neighboring economy[14]. The "bad equilbrium" we have focused on in this study has been in terms of an output slowdown or decline. A distinction needs to be made between transmission channels that are related solely to investor sentiment or psychology (termed "pure contagion"), and linkages between countries that are measurable/observable *ex-ante*. The latter are generically referred to as "spillovers" or "fundamentals-based contagion". Spillovers in turn take the form of trade (real) or financial linkages between countries.

Singapore and Hong Kong have the highest trade to GDP ratios in the world, leading Krugman (1995) to refer to them as "super traders". Insofar as trade is the "life-blood" of both these economies, *a priori*, one would expect trade spillovers, i.e. fundamentals-based contagion through trade linkages, to be of some importance. It is the focus of the remainder of this study[15].

Trade spillovers could be either due to "complementarity" or "competition" in export product structures between regional economies. With regard to the former, 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 a developing economy

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[14] Other definitions of contagion include an increase in asset price volatility across countries or a significant increase in cross-market linkages after a crisis to one country or group of countries and "excessive correlations" in asset returns across economies (i.e. above and beyond what might be expected after economic fundamentals have been taken into account).

[15] Trade spillovers, which are the primary focus of the remainder of this study (sections 4 to 6), appear to be relatively straightforward in principle. In practice though, it can be difficult to clearly distinguish between trade and financial linkages, as "most countries that are linked via trade channels tend also to be linked via finance channels" (Kaminsky and Reinhart, 2000a,b). In similar vein, Claessens et al. (2001) have noted that a "channel similar to trade links can be financial links. The process of economic integration of an individual country into the world market will typically involve both trade and financial links. In a world or region that is heavily economically integrated - covering trade, investment, and financing links - a financial crisis in one country can then lead to direct financial effects, including reductions in trade credit, FDI and other capital flows to other countries" (p.6). Nonetheless, it is much harder to distinguish between financial

is often accompanied by a sharp economic downturn (see Bird and Rajan, 2001 and references cited within), thereby compressing imports. This in turn reduces exports of its trading partners, consequently leading to "demand-driven" trade spillovers. Wincoop and Yi (2000) call this the "domestic demand" effect which is our favored term. Forbes (2001) refers to this as the "income" effect. This terminology may, however, be somewhat misleading as devaluation in crisis-affected economy could also reduce exports because of a deterioration in the terms of trade. Thus, price/terms of trade and income effects are both components of the domestic demand effect.

On the other hand, there may be extensive and growing trade, investment and other intraregional interdependencies leading to propagation of recessionary impulses due to trade complementarities that are "supply side-driven" 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 (PCAs) playing a particularly important role in such transactions (World Bank, 2000). Accordingly, a disruption in any one economy could interrupt the entire regional production network, leading investors to withdraw *en masse* from all other trade partners. Another complementary-induced channel pertains to the "cheap-imports" effect. This refers to the case where the crisis-hit economies are important import sources. In such a case, devaluation or deflation (in case of an interest rate defense) makes trade partners' imports (from the crisis economies) cheaper. Therefore, unlike the other channels, the cheap-imports effect acts as a positive supply shock (Forbes, 2001). For instance, Wincoop and Yi (2000) have argued that the currency depreciations in East Asia may have benefited the US by reducing the US dollar price of imports from that region.

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spillovers, on the one hand, and pure contagion, on the other, as both largely pertain to investors' decisions (also see the concluding section).

In contrast to the complementary-induced channels, even economies that do not have strong trade and investment linkages with the crisis-hit economies may yet be indirectly impacted if their exports to third market in substitutable goods 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) is a pioneering attempt at modeling the phenomenon of competitive devaluation. Their trade spillover model consists of two channels via which a trade partner is impacted. In the primary channel, devaluation in an export competitor leads to a deterioration in the trade balance in the partner country, causing a speculative attack on the latter. In the secondary channel, devaluation lowers the aggregate price level and demand. This leads to the domestic currency being substituted for foreign currency, depleting international reserves and making the economy vulnerable to a classic speculative attack.

Two other recent models of competitive devaluation are by Huh and Kasa (1997) and Corsetti, Pesenti and Roubini (2000) which is built on micro foundations. The Corsetti-Pesenti-Roubini model shows how a game of competitive devaluation could generate currency overshooting if market participants, anticipating that a series of competitive devaluations will occur once there is a successful speculative attack in one country, flee altogether from the trade competitors. The cheap-imports effect (Corsetti-Pesenti-Roubini refer to it as the "bilateral trade" effect) - which is welfare-enhancing as it allows the importing country to enjoy a higher level of consumption, *ceteris paribus* - is also formally captured. As they show, if this effect dominates the welfare-reducing one due to loss of product competitiveness, devaluation in one country may not necessarily lead to a net welfare loss to its trading partner. In other words, devaluation may not necessarily be "beggar-thy-neighbor".

4.   Complementary-induced Trade Spillovers

4.1   Data Preliminaries

Since both Hong Kong and Singapore are heavily service-oriented economies, a comprehensive analysis of trade linkages ought to include the services sector. However, the data problems in services trade are especially acute, since available data on most service transactions are not comprehensive, detailed, timely or even internationally comparable; sufficient data on trade in individual services are unavailable to compute trade linkage indices as done in Annexes 2 and 3. This restricts the analysis of trade contagion to merchandise trade. Nonetheless, a rather unappreciated fact is that, insofar as services act as vital inputs into the production of many manufactured goods, analysis of merchandise trade does implicitly capture trade in services somewhat partially (Deardorff, 2001).

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"[16]. 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 discrepancies lies more with other trading partners which 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

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

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).

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[17]. 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.

4.2   Domestic Demand-driven Export Linkages

Tables 7 and 8 respectively convey information on the trends in Hong Kong's and Singapore's bilateral exports to the Asia-5 economies. There are several points worth noting with respect to export linkages of Hong Kong and Singapore with the Asian-5 economies.

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. However, 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.

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[17] The 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 (following regional and ethnic turmoil).

Except for Korea, the shares of the Asia-5 economies in Hong Kong's total exports were only about 1 percent each. The combined share of all the Asia-5 economies plus Singapore in Hong Kong's total exports was only slightly over 7 percent. This figure drops to less than 5 percent if Singapore is excluded. Thus, Hong Kong's export linkages with the Asia-5 economies seem quite low in comparison to Hong Kong's overall international trade (Table 7). In contrast, roughly about one third of Singapore's exports have been to the Asia-4 economies plus Hong Kong. But when Hong Kong and Singapore's immediate neighbor, Malaysia, are excluded, this share average declines to only about 15 percent (Table 8).

The growth in Hong Kong's total exports to the Asia-5 economies has been trending sharply downwards in the 1990s, turning negative with the onset of the crisis in 1997-98 (Figure 9). 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 (Figure 10). While the general trend remains unchanged if focus is limited to 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.

Glick and Rose (1999), Van Rijckeghem and Weder (1999) and others have focused solely on market shares in trade for evidence of trade spillovers. Export shares as measures of the extent of export linkages could be misleading as they fail to account for the extent to which each of the Asia-5 economies import from the rest of the world (ROW). Accordingly, we have also computed conventional bilateral export intensity indices (Annex 2). These indices essentially seek to establish the relative importance of a trading partner in exports (country j) in relation to country j's imports from the ROW. The IMF's *Direction of Trade Statistics* is used to calculate the bilateral export intensity indices for 1985-99 since the indices need internationally

comparable data for bilateral imports of the Asian-5 economies from the ROW[18]. Computations reveal that Hong Kong's export intensity with the Asia-5 economies has generally been between 0.5 and 2.0, which is quite low when compared to Singapore's export intensity with these countries, especially for Malaysia, where the intensity index was well over 20 on average, as well as Thailand (Figures 11 and 12). While Hong Kong's export 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 declining bilateral export intensity), and increased since 1997.

4.3   Supply-side Channel: FDI Linkages

While the emphasis of complementary trade spillovers has thus far has been on demand-induced channels, 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 minimizing strategy. This "slicing of the value-added chain" has multiplied the opportunities for international specialization 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. The breakdown of intra East Asian trade by region in PCAs in 1996 shows that Singapore's trade intensity in PCAs with Indonesia and Malaysia was exceptionally high at around 8, while that with Thailand was over 5. This further indicates strong complementarities between Singapore and some of the Asia-5 economies. This is in sharp contrast to Hong Kong, whose trade intensity index for PCAs with

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[18] Given this database, we are unable to make a distinction between re-exports and domestic exports.

the Asia-5 economies was just about one). Hong Kong's largest trade intensities (about 5) were with Mainland China and Taiwan.

Insofar as a large part of such intraproduct specialization 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) flows have contributed significantly to domestic capital formation and growth in the regional economies, especially Hong Kong and Singapore[19].

Data on direct investment itself are not always easily available, and when available, are not always directly comparable across countries. Keeping this 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 9a). 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 9b). Hence, 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.

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[19] 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 to 23 percent (inward)

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 10a). The Asia-5 economies were not significant investors in Hong Kong; neither was Singapore. Hong Kong's outward investments were overwhelmingly directed towards Mainland China (US$267 billion in 1997) (Table 10b). The only other significant investment destination was Indonesia (US$15.6 billion in 1997). Direct investments to Singapore, Thailand, Malaysia, the Philippines and Korea *in aggregate* constituted less that US$ 8 billion in investments in 1997.

4.4   Cheap-Imports Effect

Intraregional investments and PCA trade ought to give rise to the simultaneous import and exports of goods between the source and host economies. As noted, one factor that might counteract the welfare reducing effects of strong trade complementarities is the cheap-imports effect. Accordingly, it would be useful to consider trends in import linkages of Singapore and Hong Kong with the Asia-5 economies. The main findings are as follows.

Other than for Korea, the shares of the Asia-5 economies in Hong Kong's total imports were only about 1-2 percent each. The combined share of all the Asia-5 economies plus Singapore in Hong Kong's total exports was slightly around 14 percent. These figures respectively drop to slightly over 10 percent if Singapore is excluded. Hence, Hong Kong's import linkages with the Asia-5 economies are quite low in comparison to Hong Kong's overall international trade (Table 7). In contrast, roughly about one third of Singapore's imports have been from the Asia-5 economies plus Hong Kong. However, when Hong Kong and Singapore's immediate neighbor, Malaysia are excluded, this share declines on average to only about 12 percent (Table 8).

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and 18 percent (outward), respectively; that of Hong Kong amounted to 12 and 55 percent, respectively (UNCTAD, 1999).

The preceding analysis indicates that Singapore's import linkages with the crisis-hit regional economies and Hong Kong itself was stronger than that of Hong Kong's import linkages with the region. Forbes (2001) estimates how trade linkages affect a country's stock market returns during crises periods, and finds only weak evidence for the cheap-imports effect. This effect is measured as an index of total imports from the trigger country into its trading partner as a proportion of the trading partner's total consumption plus investment (Annex 3). The higher this index, the greater is the effect, as the non-crisis economies benefit from cheaper imports from the crisis economies. Computations using UN data SITC 4-digit level for 1997 reveal that the import effects of Hong Kong were highest vis-à-vis Korea at 7.6 and 4.0 with Thailand, Indonesia and the Philippines in aggregate. In the case of Singapore, its index with respect to Korea was similarly high at 6.4 but was much higher with Thailand at 10.2 (Table 11). This appears to suggest that part of the negative effects of trade spillovers might have been cushioned by this positive supply shock, though, as noted, Forbes (2001) has shown that this effect is not of statistical significance in general.

5.   Quantifying the Demand-driven Trade Effect

The preceding section has detailed the various complementarity based trade spillover channels between the Asia-5 economies and the twin cities that could lead to a transmission of recessionary impulses from the former to the latter via the domestic demand channel. This section is divided into three parts. In section 5.1, we estimate a set of merchandise export demand functions so as to ascertain the importance of foreign (i.e. Asia-5) income and price (terms-of-trade) variables in impacting Singapore's and Hong Kong's exports to the Asia-5 economies. As noted, the domestic demand effects could operate via the income or price effects. Putting these two effects together, we then proceed, in section 5.2, to estimate a model which relates the aggregate demands of Hong Kong and Singapore to their respective exports to the Asia-5 economies. The objective here is to determine the statistical significance of the contributions of

these exports on the aggregate output performances of the twin cities in the long run. To complement the formal test undertaken in section 5.2, in section 5.3 we construct a "direct trade effect index" to quantify the *economic* (as opposed to *statistical*) impact of an economic slowdown in the Asia-5 economies on the twin cities during the crisis period of 1997-98. Section 5.4 offers a section summary.

5.1   Export Demand Functions

a)   The Model, Data and Preliminaries

There are two primary determinants of export demand (Dornbusch, 1988). First is the foreign income variable (y_{jt}). Second is the relative price or the terms of trade variable ($tot_{(i \to j)t}$). Our primary working model can be represented as follows:

$$X_{(i \to j)t} = \alpha + \beta_1 y_{jt} + \beta_2 tot_{(i \to j)t} + \varepsilon_t \tag{1}$$

where: $X_{(i \to j)t}$ =   export of country *i* (Hong Kong or Singapore) to country *j* (Indonesia, Malaysia, Thailand and Korea);

y_{jt} =   real income of country *j* (Indonesia, Malaysia, Philippines, Thailand and Korea);

$tot_{(i \to j)t}$ =   terms of trade of country   *i* (Hong Kong or Singapore) to country *j* (Indonesia, Malaysia, Thailand and Korea);

α and ε =   constant term and error term, respectively.

The variable (y_{jt}) captures the "income effect". As discussed, when a crisis affects a country's income level and growth rate, we would expect that the country's import demand will decline. The ($tot_{(i \to j)t}$) variable represents the relative "price effect".

Detailed descriptions of the variables are presented in Table 12. Since no data are available for the terms of trade between Hong and Singapore with the rest of these economies, we need to make use of a suitable proxy. We calculate the terms of trade data by dividing Hong

Kong's and Singapore's unit value of export with that of exports of the Asia-5 economies (a proxy for the unit value of import of Hong Kong and Singapore from each of the Asia-5 economies). Before conducting any formal empirical tests on the variables, it is necessary to examine basic unit-root properties of the relevant time-series variables. We employ the commonly used ADF-unit root test (eq. 2), where vector {y} incorporates all the variables presented in Table 13. Variable t represents the time-trend. Δ denotes the first difference of the variable. α and ε are constant and error terms, respectively.

$$\Delta y_t = \alpha + \beta.t + \delta.y_{t-1} + \sum_{i=1}^{k} \gamma_i \cdot \Delta y_{t-i} + \varepsilon_t \qquad\qquad (2)$$

b)   *Test Results*

From the test results, we can conclude that all relevant time-series variables are integrated of order 1. We next test the cointegration relationship in each export function model. The goal here is to test for any possible long-run relationships between the exports of Hong Kong and Singapore with the price and income variables. Evidence of the long-run relationship indicates that Hong Kong's and Singapore's exports to the Asia-5 economies do not fluctuate independently from the outputs of the latter. Test results are presented in Table 14 and 15. Note that we do not have results for Hong Kong's and Singapore's exports to the Philippines, as well as Singapore's exports to Indonesia due to unavailability of data[20]. Our pre-crisis tests include observations from the early 1980s to the second quarter of 1997 (i.e. just prior to the crisis).

All the test results confirm the presence of long-run relationships in each of the export demand functions. Results indicate that one cointegrating equation cannot be rejected at 5 per cent significance level and at the 1 per cent level in the case of Singapore's exports to Korea. In the case of exports to Thailand and Malaysia from the twin cities, we find that the income factor

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[20] No terms of trade data for the Philippines case are available from 1992 onwards. Similarly, no official data on Singapore's exports to Indonesia are available.

contributed more significantly than the terms of trade variable. In contrast, we find the terms of trade had more weight in explaining the fluctuations of the exports of Hong Kong and Singapore to Korea than the income factor. As for the exports between Hong Kong and Singapore, we find that Singapore's exports to Hong Kong are influenced more by the aggregate demand (income factor) of Hong Kong, while on the other hand, fluctuations in Hong Kong's exports to Singapore are explained more by the terms of trade (price factor).

5.2   Importance of Exports in Explaining Output Changes in the Twin Cities

Having derived evidence of a long-run nexus between exports of Hong Kong and Singapore with the incomes of crisis-effected East Asian economies and the terms of trade factor, the next linkage to examine is the role of these exports in explaining the performance of Hong Kong's and Singapore's economy in terms of their respective GDPs. To formally capture this second link we test the following empirical model[21]:

$$Y_i = \alpha_t + F(X_{(i \to j)t}) + \varepsilon_t \qquad (3)$$

where: F (.) represents a general functional form; Y_i is an aggregate demand of Hong Kong/ Singapore. $(X_{(i \to j)t})$ are exports of Hong Kong and Singapore to the East Asian economies (as described earlier); α_t and ε_t respectively denote the intercept and an error term.

Since all the variables are integrated of order 1 (Table 13), we proceed to test the cointegration relationship among them. For Singapore, exports to Hong Kong, Malaysia and

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[21] From the standard text-book construction of the aggregate demand (income) of an open economy, we can express the aggregate demand function from the usual expenditure approach:

$$Y = C + I + G + (X - M)$$

where: Y is the aggregate demand; C is the household's consumption; I is the investment variable; G is the government expenditure; X is total exports; and M is total imports. Since our main interest is to estimate the role of export in explaining the performance of the aggregate demand, our general empirical model can be simplified as in eq. 3.

Thailand are co-integrated with the city-state's income variable (Table 16b). Among these three export markets, exports to Hong Kong contributed the most to the output performance of Singapore. On the other hand, Singapore's exports to Thailand had the least contribution. Given the close economic linkages with Malaysia, it is of no surprise that Singapore's exports to its neighbor had a statistically significant influence on its domestic output. As stated before, no official quarterly data are available for Singapore's exports to Indonesia. We dropped Singapore's exports to Korea and the Philippines as their coefficients were either insignificant or showed inconsistent signs[22]. Hong Kong's exports to Korea, Philippines and Singapore were found to be co-integrated with its output (Table 16a)[23].

5.3   Direct Trade Effects (Crisis Period)

The preceding findings generally confirm that weak aggregate demand in the Asia-5 economies reduced their propensities to import, with consequent real effects on the twin cities, particularly in the case of Singapore. But how important is this in an economic sense? To answer this question we examine the crisis period of 1997-98. Hong Kong experienced a significant contraction of its exports (in US dollar) to all Asia-5 economies, ranging from around 20 to 45 per cent from the 1997 total values (Table 17). Similarly, Singapore's merchandise exports saw a negative growth rate in 1998, albeit at a lower rate than Hong Kong's (Table 18)[24].

To gain a better sense of the magnitude of a direct trade impact of weak export demand by the Asia-5 economies on the aggregate demand of Hong Kong and Singapore, we next calculate the direct trade effect estimates. This index has been recently used by Conway (2001)

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[22]   We expect the coefficients for each export to be positive. Inclusion of one or both of these export variables in the testing actually worsens the test results.

[23] Inclusion of Hong Kong's exports to Malaysia, Indonesia and Thailand actually worsened the test results. This problem may possibly due to a limited sample period. The official Hong Kong's GDP data is only available starting from the second quarter of 1985.

and Pollard and Coughlin (1999) (see Annex 2). 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 framework (see next section). Nonetheless, 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 basis for the post-crisis period analysis only[25].

Two steps are involved in the calculation of the direct trade index. First is to 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 is to 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 17 and 18). 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, Philippines, Thailand and Korea constituted

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[24]   As for the pre-crisis period, we repeat again that we do not have data on Singapore's exports to Indonesia during the crisis.

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 unfavorable 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 effect 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 percent 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.

5.4   Section Summary

The earlier sections indicate that Singapore had much stronger demand-driven export linkages with the Asia-5 economies than Hong Kong, well before and into the crisis. This suggests that once a crisis originated in these Asia-5 economies, reducing their import demand, the adverse impact of a demand induced trade spillovers would be felt more in Singapore than in Hong Kong. These findings are consistent with the trends in bilateral export intensity analyzed earlier. They are also broadly in line 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 third-country and other 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 in Thailand affects Singapore's exports to the former directly; Thailand's exports from other countries are also impacted, reducing growth in

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[25] In addition, Abeysinghe and Forbes (2001) highlight several shortcomings with the standard VARs, such as arbitrary identification restrictions and poor forecasting performance (also see section 5.4).

these countries. Insofar as these economies source products from Singapore, its exports are also hurt indirectly. Consequently, as Abeysinghe 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 normalized multiplier effect (impulse response) after one year is 1.36 units, and that of Hong Kong's is only about 0.4 (Table 19). Singapore's dependence on Hong Kong is relatively high (0.6) but not vice versa (0.2). This result is consistent with our findings above.

To sum up, 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, 2000a,b)[26]. Singapore was further adversely impacted by the recession in Hong Kong. But what about Hong Kong? The data and tests do not reveal any significant interdependencies between Hong Kong and the Asia-5 economies, with the possible exception of the Philippines. Therefore, it is unlikely that either domestic demand or supply side trade or FDI spillovers with the Asia-5 economies played a significant role in its contagious spread to Hong Kong. This leads us to examine the possibility that the crisis spread via competitiveness-driven trade spillovers.

6.   Spillovers due to Trade Competition

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

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 at a competitive disadvantage.

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[27]. 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" real exchange rates in Hong Kong and Singapore is instructive in this regard (Rajan and Siregar, 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 appeared overvalued pre-crisis, and the degree of overvaluation deteriorated sharply during the crisis following the spate of regional currency devaluations[28].

6.1   Revealed Comparative Advantage Index

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[27] 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 empirical confirmation of this phenomenon.

[28] But it does not necessarily follow that Hong Kong would be well advised to forsake its currency board regime in favor 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 destabilizing (Eichengreen, 1999 and

In search of the significance of the competition-driven trade channel we compare the comparative advantages of the two cities 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 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 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 20)[29]. Our analysis focuses on 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 labor intensive goods, physical capital intensive goods, human capital intensive goods and technology intensive goods. The data source used is the *UN International Trade Statistics Yearbook*.

Between 1982 and 1996, while Hong Kong's level of specialization in unskilled labor 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 specialization towards technology intensive goods, the RCA declining from 1.5 in 1982 to 1.2 in 1996. In contrast, Singapore was successful in increasing its specialization 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

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.

[29] We do not show the index for 1982 in Table 20.

economies? Except for Indonesia, the rest generally moved towards greater specialization 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 labor 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 labor intensive goods during this time.

Data on finals goods provide only a partial and incomplete analysis. As noted, PCAs have constituted a large and growing share of East Asian trade in manufactured goods. 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)[30].

6.2   Export Similarity Index

While the RCA index using export statistics is useful as a first test of trade complementarity, it is a proxy measure of specialization 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 21 lists the top twenty exports of Singapore and Hong Kong at the SITC-3 digit level for 1999[31]. Out of the twenty products, eight products overlap between the two economies.

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

All these products belong to the category of machinery and transport equipment, and more specifically, electronic products and electrical equipment[32]. 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 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[33]. 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, implying that export structures between the two countries were fairly dissimilar.

Table 22 highlights the cross-country correlations of export structures at the available 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-hit economies (0.47)[34]. 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.

6.3   Competitiveness Index

An alternative index of competitiveness is computed by Forbes (2000) who uses UN data at an SITC 4-digit level for 1997. This index takes a value of 0 (no competitiveness or product

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

[32] 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).

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

[34] 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.

overall) and a high of 100 (maximum product overlap). The competitiveness index of Hong Kong with the crisis-hit economies ranged between a low of 4.3 in the case of the Philippines and Indonesia and a high of 12.9 in the case of Korea. In marked contrast, Singapore's index ranged between a high of 100.0 (maximum index value) in the case of Korea and lows of 23.2 in the case of Indonesia and 27.6 in the case of the Philippines. The index of Hong Kong and Singapore vis-à-vis the trigger country, Thailand, was 7.2 and 60, respectively. By way of background, note that for 58 countries in the sample, the mean competitiveness index with respect to Thailand was 8.2, 2.9 in the case of the Philippines, 7.9 for Indonesia and 12.6 in the case of Korea (Table 11). Singapore's competitiveness index was the highest among all the 58 countries vis-à-vis the three of the four crisis countries examined, Indonesia being the exception[35]. This further stresses that Singapore was in more direct competition with the crisis-hit economies than was Hong Kong, and was therefore more susceptible to competition-induced trade spillovers[36].

7.   Summary and Concluding Remarks

Both Hong Kong and Singapore suffered from contagious fallout from the East Asian crisis of 1997-98 despite being well acknowledged as having relatively sound financial and economic fundamentals. The sole aim of this study has been to determine the importance of trade spillovers in explaining the contagious transmission of recessionary impulses from the five regional countries most directly impacted by the crisis (viz. Indonesia, Malaysia, the Philippines and Korea and Thailand) to the "twin cities".

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[35] As noted by Forbes (2001), the main products in which Singapore and Korea are in direct competition include electronic microcircuits, input or output units, storage units for data processing, color television receivers, sound and video recordings, parts for telecommunications equipment, and ships, boats and other vessels.

[36] Note though that the Forbes (2000) analysis uses only total exports data for computation of such effects, and not domestic exports.

The overall analyses of trade and direct investment links suggest that Singapore's web of close trade and investment complementarities with Malaysia in particular, but also the other regional economies, underpinned the transmission of the regional shocks from the Asia-5 economies to the city-state. Singapore's competitive export structures with the Asia-5 economies, especially in parts and components, may also have been an important factor in spreading the crisis to Singapore. In other words, Singapore was affected by trade linkages which operated through both an income effect mainly via falls in aggregate demand in other regional economies, but also due to a price or competitiveness effect via the appreciation of the Singapore dollar vis-à-vis regional currencies[37]. The deep but short-lived recession experienced by Hong Kong further exacerbated the recessionary impulses to Singapore.

The case of Hong Kong is less straightforward when seen through the lens of trade spillovers. Hong Kong has 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. Hong Kong's trade, investment and other commercial links have been predominantly oriented towards Mainland China rather than the Asia-5 economies. In addition, the recessionary impulses from Hong Kong to Singapore were far more important than vice versa. This leads to the conclusion that one needs to look elsewhere for a rationalization of the transmission of the recessionary impulses to the East Asian crisis to Hong Kong. These include either trade spillovers for reasons not explored in this paper (due to data limitations), such as trade with Taiwan or services trade in general, or non-trade contagion channels, viz. financial spillovers, "pure contagion" or "common shocks" (see fn 2).

Masson (1998) shows how it is conceptually possible for "pure contagion" to make an economy relatively more susceptible to a currency crisis. To be sure, he notes that

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[37] The importance of the price response of supply of exports in the Asia-5 economies plus Hong Kong and Singapore has also been confirmed by Duttagupta and Spilimbergo (2000) who use a new monthly database on exports of selected industries.

> pure contagion is only possible if changes in expectations are self-fulfilling, and this requires that financial markets be subject to multiple equilibra..(and)..(e)ven if each country separately is not subject to multiple equilibra, together they may be, since the fear of crisis in one will increase the devaluation probability in the other, making a crisis more likely in both.

Shifts in market sentiments could lead to jumps between one equilibra and the other, consequently introducing sharp volatility in financial markets. Theoretically, anything could act as the coordinating device leading to a jump from a "good" to "bad" equilibra.

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 (see fn 15), 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[38]. 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 impacted by a decline in these hub-related service activities.

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[38] 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.

Annex 1: Exchange Rate Arrangements in Hong Kong and Singapore

A1.1   The Hong Kong Currency Board[39]

Hong Kong adopted the currency board system in October 17, 1983. Since then, the Hong Kong dollar has been fixed at the nominal rate of 1 US dollar = 7.80 Hong Kong dollars. A one percent bandwidth regulates the fluctuation of the nominal rate of HK dollar against the US dollar. During the initial period of present currency board system, the Hong Kong monetary authority (HKMA) was, by and large, passively following the automatic adjustment mechanism of the currency board. However, since 1988, Hong Kong has been characterized as having moved from a "rule-bound regime" to a "new regime in which active discretionary interventions were pursued". This is so as the HKMA introduced several new key monetary instruments which allowed the policy makers the opportunity to engage in more discretionary intervention in the money and foreign exchange markets (Kwan et al., 1999).

A1.2   Singapore's Managed Float[40]

While the Singapore exchange regime has maintained a basic element of the currency board system in the sense that the currency in circulation is 100 per cent backed by international assets for currency issuing, this is primarily done to maintain public confidence in currency. The Monetary Authority of Singapore (MAS) manages the Singapore dollar against a basket of currencies of Singapore's main trading partners and competitors. The central parity/level is determined in the basis of countries that are the main sources of imported inflation and competition in export markets. To be sure, the Monetary Authority of Singapore (MAS) describes its exchange rate policy as follows:

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[39] For a detailed and informative discussion of the evolution and operation of Hong Kong's currency board regime, see Chiu (2001) and HKMA (2000b).

[40] See Lu and Yu (1999) for a discussion of the historical background, evolution and institutional arrangements supporting Singapore's managed exchange rate regime. This section draws on Rajan (2001b).

(the) MAS manages the Singapore dollar against a basket of currencies of Singapore's main trading partners and competitors. The basket is composed of the currencies of those countries that are the main sources of imported inflation and competition in export markets…The trade-weighted Singapore dollar is allowed to float within an undisclosed target band. The level and width of the band are reviewed periodically to ensure that they are consistent with economics fundamentals and market conditions. The MAS intervenes in the foreign exchange market from time to time to ensure that movements of the..(Singapore dollar) exchange rate are orderly and consistent with the exchange rate policy (obtained from the MAS website: http://www.mas.gov.sg).

Estimates of derived weights suggest that the US dollar had a weight of about 0.6, the remainder being divided between the yen and other currencies (Table 23). The Singapore dollar is allowed to float within an undisclosed target band around the computed central parity. Neither the central parity nor the bandwidth is completely fixed, being periodically reviewed so as to ensure that they are "consistent with economics fundamentals and market conditions". In effect, the MAS seems to have adopted a "monitoring band" as opposed to a more conventional "crawling band", in which there is an obligation to defend the edges of the band. The obligation in the case of a monitoring band is "instead to avoid intervening within the band" (notwithstanding intermittent intervention to "smooth out" exchange rate fluctuations as opposed to trying to defend the currency) (Williamson, 1998).

To illustrate the degree of flexibility - of the Singapore exchange rate policy, the MAS allowed the Singapore dollar to depreciate by about 20 percent during the height of the East Asian crisis; while more recently, it is suspected to have intervened heavily in the market to prop up the Singapore dollar during the bearishness against regional currencies following sharp falls in the NASDAQ (The Straits Times, May 12, 2000). Admittedly, this sort of monitoring band may be interpreted by some as being no different from a dirty floating regime. However, unlike a floating regime, with a monitoring band, the threat of possible intervention by the monetary authority may suffice to reduce speculative attacks. The point of a monitoring band (or a crawling band with soft edges) is that if the authority decides that market pressures are overwhelming, it can choose to allow the rate to take the strain even if this involves the rate going outside the band (Williamson, 1998).

Annex 2: Trade Indices

A2.1 Trade Intensity Index

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

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

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.

A 2.2 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:

$$\Delta X^{HK/SG} = X_0^{HK/SG}\left(\dot{X}_S^{HK/SG} - \dot{X}_{NS}^{HK/SG}\right) \tag{2}$$

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 the Asia-5 on Hong Kong's / Singapore's GDP growth is given

by

$$\Delta \dot{Y} = \left(\frac{Y_1 - \Delta X^{HK/SG} - Y_0}{Y_0}\right) - \left(\frac{Y_1 - Y_0}{Y_0}\right) = -\left(\frac{\Delta X^{HK/SG}}{Y_0}\right) \tag{3}$$

where Y_0 denotes Hong Kong / Singapore's GDP in period 0 and Y_1 denotes the same in period 1.

Substituting (2) into (3), one gets

$$\Delta \dot{Y} = -\frac{X_0^{HK/SG}}{Y_0}\left(\dot{X}_S^{HK/SG} - \dot{X}_{NS}^{HK/SG}\right) \tag{4}$$

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 an

export growth slowdown on Hong Kong's/Singapore's GDP growth.

A2.3 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:

$$\textbf{RCA} \quad = \quad \frac{\textbf{X}_i^k / \textbf{X}_i}{\textbf{X}_w^k / \textbf{X}_w} \tag{5}$$

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 specialized in exports of that category and from one to infinity if it is specialized[41].

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[41] The RCA index is therefore 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).

Annex 3: Trade Linkage Indices

These indices are useful in analyzing the impact of trade spillovers from the crisis originating country (viz. country 0) to a trading partner (country i). We consider two effects: i) Competitiveness effect ii) Cheap-import effect.

A3.1 Competitiveness Effect Index

The measure of competitiveness effect is given as

$$Compete_i = \frac{100}{Max_{Compete}} \sum_k \left(\frac{Exports_{0,k,w}}{Exports_{w,k}} \right) * \left(\frac{Exports_{i,k,w}}{GDP_i} \right) \tag{6}$$

This index denotes the competitiveness effect of exports of the i'th country as a weighted average of the share of the k'th product of exports from the crisis-affected country 0 in total world exports of the same product, and the share of these product exports of i'th country in its total GDP. The weights are the maximum calculated value of the index. Thus, competitiveness of exports of a non-crisis country is positively related to the share of its trading partner's, the crisis-affected country's share of each commodity of exports in its world exports, and the share of these same products of exports in their GDP by this index. The index takes values from 0 to 100.

A3.2 Cheap-Imports Effect

The third effect is the cheap-imports effect which is measured as

$$Cheap\_Im\,port_i = \frac{\sum_k Im\,port_{i,k,0}}{Consumption_i + Investment_i} \tag{8}$$

This index is again a ratio, measuring the share of total imports of country i from crisis-affected country 0 in its total private consumption and gross domestic investment. The index indicates that as country 0 devalues, the terms of trade for country i. improves, and this leads to a higher level of imports, consumption and growth.

Bibliography

Abeysinghe, T. (2000). "Electronics and Growth Cycles in Singapore", <u>Applied Economics</u>, 32, pp.1657-63.

Abeysinghe, T. and K. Forbes (2001). "Trade Linkages and Output-Multiplier Effects: A Structural VAR Approach with a Focus on Asia", mimeo (March).

Akamatsu, K. (1962). "A Historical Pattern of Economic Growth in Developing Countries", <u>The Developing Economies</u>, 1, pp.17-31.

Arndt, S. (1998). "Super-specialization and the Gains from Trade", <u>Contemporary Economic Policy</u>, XVI, pp.480-5.

Asian Development Bank (ADB) (2000). <u>Key Indicators of Developing Asian and Pacific Countries 2000, Volume 31</u>, Manila: ADB.

Balassa, B. and M. Noland (1989). "Revealed Comparative Advantage in Japan and the United States", <u>Journal of International Economic Integration</u>, 4, pp.8-22.

Bird, G. and R. Rajan (2001). "Recovery or Recession? Post-Devaluation Output Performance: The Thai Experience", <u>Discussion Paper No.0043</u>, Centre for International Economic Studies, University of Adelaide.

Calvo G. and E. Mendoza (2000). "Rational Contagion and the Globalization of Securities Markets", <u>Journal Of International Economics</u>, 51, pp.79-113

Calvo, S. and C. Reinhart (1996). "Is there Evidence of Contagion Effect", in G. Calvo, M. Goldstein and E. Hochreiter (eds.), <u>Private Capital Flows to Emerging Economies After the Mexican Crisis</u>, Washington, DC: Institute for International Economics.

Caprio, G. Jr. (1998). "Banking on Crises: Expensive Lesson from Recent Financial Crises", mimeo (June).

Chiu, P. (2001). "Hong Kong's Experience in Operating the Currency Board System", paper presented at IMF Seminar on exchange Rate Regimes: Hard Pegs or Free Floating" (Washington, DC, March 19-20).

Chow, P. (1990). "The Revealed Comparative Advantage of the East Asian NICs", <u>The International Trade Journal</u>, 5, pp. 235-262.

Claessens, S., R. Dornbusch and C.P. Yung (2001). "Contagion: Why Crises Spread and How This Can be Stopped", in S. Claessens and K. Forbes (eds.), <u>International Financial Contagion</u>, MA: Kluwer Academic Publishers, forthcoming.

Claessens, S. and T. Glaessner (1997). "Are Financial Sector Weaknesses Undermining the East Asian Miracle?", <u>Directions in Development</u>, World Bank, January.

Claessens, S. and T. Glaessner (1998). "Internationalization of Financial Services in Asia", <u>Policy Research Working Paper No.1911</u>, World Bank.

Conway, P. (2001). "US Slowdown: Implications for the New Zealand and Australian Business Cycles", Occasional Paper, Westpac Institutional Bank, Wellington, New Zealand.

Corsetti, G., P. Pesenti and N. Roubini (2000). "Competitive Devaluations: Toward a Welfare-Based Approach", Journal of International Economics, 51, pp.217-41.

Deardorff, A. (2001). "International Provision of Trade Services, Trade, and Fragmentation", Review of International Economics, 9, pp.233-48.

De Gregario, J. and R. Valdes (2001). "Crisis Transmission: Evidence from the Debt, Tequila, and Asian Flu Crises", in S. Claessens and K. Forbes (eds.), International Financial Contagion, Boston, MA: Kluwer Academic Publishers, forthcoming.

Dobson W. and Chia, S. (1998). Multinationals and East Asian Integration, International Development Research Centre (IDRC), Canada and The Institute of South East Asian studies (ISEAS), Singapore.

Dornbusch, R. (1988). Exchange Rates and Inflation, Cambridge: MIT Press.

Dungey, M. and V. Martin (2000). "Measuring Contagion in the East Asian Currency Crisis", mimeo (October).

Duttagupta, R. and A. Spilimbergo (2000). "What Happened to Asian Exports During the Crisis?", Working Paper No.00/200, IMF.

Eichengreen, B. (1999). "Kicking the Habit: Moving from Pegged Rates to Greater Exchange Rate Flexibility", Economic Journal, 109, pp.c1-c14.

Eichengreen, B., A. Rose and C. Wyplosz (1996). "Contagious Currency Crisis", Scandinavian Economic Review, 98, pp.463-84.

Eichengreen, B., P. Masson, H. Bredenkamp, B. Johnston, J. Hamann, E. Jadresic and I. Otkern (1999). "Exit Strategies: Policy Options for Countries Seeking Greater Exchange Rate Flexibility", Occasional Paper 168, IMF.

Feenstra, R., W. Hai, W. Woo and S. Yao (1998). "The U.S.-China Bilateral Trade Balance: Its Size and Determinants", Working Paper No.6598, NBER.

Feenstra, R. and A. Rose (2000). "Putting Things in Order: Patterns of Trade Dynamics and Growth", Review of Economics and Statistics, 82, pp.369-82.

Forbes, K. (2000). "The Asian Flu and Russian Virus: Firm-level Evidence on How Crises are Transmitted Internationally", Working Paper No.7807, NBER.

Forbes, K. (2001). "Are Trade Linkages Important Determinants of Country Vulnerability to Crises?", Working Paper No.8194, NBER.

Forbes, K. and R. Rigobon (2001). "No Contagion, Only Interdependence: Measuring Stock Market Co-movements", mimeo (January).

Frankel, J. and S. Schmukler (1996). "Crisis, Contagion, and Country Funds: Effects on East Asia and Latin America", Working Paper No.96-04, Center for Pacific Basin Monetary and Economics Studies, Federal Reserve of San Francisco.

Frankel, J. and S. Wei (1994). "Yen Bloc or Dollar Bloc?: Exchange Rate Policies of the East Asian Countries", in T. Ito and A. Krueger (eds.), Macroeconomic Linkage: Savings, Exchange Rates, and Capital Flows, Chicago: University of Chicago Press.

Gab-Je, J. and T. Willett (2000). "Currency Market Reactions to Good and Bad News During the Asian Crisis", Seoul Journal of Economics, 13, forthcoming.

Garnaut, R. and K. Anderson (1980). "ASEAN Export Specialization and the Evolution of Comparative Advantage in the Western Pacific Region" in R. Garnaut (ed.), ASEAN in a Changing Pacific and World Economy, Canberra: ANU Press.

Gerlach, S. and F. Smets (1995). "Contagious Speculative Attacks", European Journal of Political Economy, 11, pp.5-63.

Glick, R. and A. Rose (1999). "Contagion and Trade: Why are Currency Crises Regional?", Journal of International Money and Finance, 18, pp.603-17.

Goldstein, M. and J. Hawkins (1998). "The Role of Contagion in the Asian Financial Crisis", mimeo, Reserve Bank of Australia.

Hong Kong, Census and Statistics Department. Hong Kong Annual Digest of Statistics, various issues.

Hong Kong, Census and Statistics Department. Hong Kong Trade Statistics: Domestic Exports and Re-exports, Annual Supplement, various issues

Hong Kong, Census and Statistics Department. Review of Hong Kong External Trade, various issues.

Hong Kong Monetary Authority (HKMA). "The Domestic Environment", Quarterly Bulletin, various issues.

Hong Kong Monetary Authority (HKMA) (1998). "Strengthening of Currency Board Arrangements in Hong Kong", Quarterly Bulletin, November, pp.1-5.

Hong Kong Monetary Authority (HKMA) (2000a). "Macroeconomic Impact of Recent Fiscal Measures", Quarterly Bulletin, February, pp.1-15.

Hong Kong Monetary Authority (HKMA) (2000b). "Hong Kong's Linked Exchange Rate System", Background Brief No.1, HKMA.

Huh, C. and K. Kasa (1997). "A Dynamic Model of Export Competition, Policy Coordination, and Simultaneous Currency Collapse", Working Paper PB 97-08, Center for Pacific Basin Monetary and Economics Studies, Federal Reserve of San Francisco.

Hsieh, C.T. (2000). "What Explains the Industrial Revolution in East Asia?: Evidence from the Factor Markets", mimeo (October).

International Monetary Fund (IMF) (1997). World Economic Outlook: Interim Assessment, Washington, DC: IMF (December).

International Monetary Fund (IMF) (2000). "Singapore: Statistical Appendix", Staff Country Report No.00/84, IMF.

International Monetary Fund (IMF). Direction of Trade Statistics, various issues.

International Monetary Fund (IMF). International Financial Statistics, various issues.

International Monetary Fund (IMF). Press Information Notices (Hong Kong and Singapore), various issues.

Kalra, S., D. Mihaljek and C. Duenwald (2000). "Property Prices and Speculative Bubbles: Evidence from Hong Kong SAR", Working Paper No.00/2, IMF.

Kaminsky, G. and C. Reinhart (1999). "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems", American Economic Review, 89, pp.473-500.

Kaminisky, G. and C. Reinhart (2000a). "On Crises, Contagion, and Confusion", Journal of International Economics, 51, pp.145-68.

Kaminsky, G. and C. Reinhart (2000b). "Bank Lending and Contagion: Evidence from the Asian Crisis", in T. Ito and A. Krueger (eds.), Regional and Global Capital Flows: Macroeconomic Causes and Consequences, Chicago: University of Chicago Press.

Kaminsky, G. and S. Schmukler (1999). "What Triggers Market Jitters?: Chronicle of the Asian Crisis", Journal of International Money and Finance, 18, pp.537-56.

Kasa, K. (1997). "Does Singapore Invest Too Much?", Economic Letter No.97-15, Federal Reserve Bank of San Francisco.

Kawai, M. and S. Urata (1998). "Are Trade and Direct Investment Substitutes or Complements?: An Empirical Analysis of Japanese Manufacturing Industries", in H. Lee and D. Roland-Holst (eds.), Economic Development and Cooperation in the Pacific Basin, New York: Cambridge University Press.

Koh, D. and J. Cuervo (2000). "Singapore: Containing the Real Estate Boom", in K. Mera and B. Renaud (eds.), Asia's Financial Crisis and the Role of Real Estate, New York: M.E. Sharpe.

Krueger, M., P. Osakwe and J. Page (1998). "Fundamentals, Contagion and Currency Crises: An Empirical Analysis", Working Paper No.98-10, Bank of Canada.

Krugman, P. (1995). "Growing World Trade: Causes and Consequences", Brookings Papers on Economic Activity, 1, pp.327-77.

Kwan, C. (1995), Enken no Keizaigaku (The Economics of the Yen Bloc), Tokyo: Nihon Keiza Shinbunsha) (in Japanese).

Kwan, Y. K. Francis, T. Lui and L. Cheung (1999), "Credibility of Hong Kong's Currency Board: The Role of Institutional Arrangements" mimeo (August).

Laursen, K. (1998). "Revealed Comparative Advantage and the Alternatives as Measures of Specialization", Working Paper No.98-30, Copenhagen Business School, Denmark (DRUID).

Lemoine, F. (1998). "Integrating Central and Eastern Europe in the European Trade and Production Network", BRIE Working Paper No.107, Centre for German and European Studies and University of California, Berkeley.

Liu, L, M. Noland and S. Robinson (1998). "Asian Competitive Devaluations", Working Paper 98-2, Institute for International Economics.

Lu, D. and Q. Yu (1999). "Hong Kong's Exchange Rate Regime: Lessons from Singapore", China Economic Review, 10, pp.122-40.

Masson, P. (1998). "Contagion: Monsoonal Effects, Spillovers, and Jumps between Multiple Equilibria", Working Paper No.98/142, IMF.

Mera, K. and B. Renaud (eds.), Asia's Financial Crisis and the Role of Real Estate, New York: M.E. Sharpe.

Ng, F. and A. Yeats (1999). "Production Sharing in East Asia: Who Does What for Whom, and Why?", Policy Research Working Paper No.2197, World Bank.

Nitithanprapas, E. and T. Willett (2000). "A Currency Crisis Model that Works: A Payments Disequilibrium Approach", Working Paper No.2000-25, Claremont Institute for Economic Policy Studies, CA.

Noland, M. (1997). "Has Asian Export Performance been Unique?", Journal of International Economics, 43, pp. 79-101.

Pearson, C. (1994). "The Asian Export Ladder", in S. Yang (ed.), Manufactured Exports of East Asian Industrializing Economies: Possible Regional Cooperation, M.E. Sharp: New York.

Pollard, P. and C. Coughlin (1999). "Going Down: The Asian Crisis and U.S. Exports", Review, Federal Reserve Bank of St. Louis, March/April, pp.33-45.

Pritsker, M. (2000). "The Channels for Financial Contagion", mimeo (August).

Rajan, R. (1999). "Economic Collapse in Southeast Asia", Policy Study, The Lowe Institute of Political Economy, Claremont, California (March).

Rajan, R. (2001a). "(Ir)relevance of Currency Crises Theory to the Devaluation and Collapse of the Thai Baht", Princeton Studies in International Economics No.88, International Economics Section, Princeton University (February).

Rajan, R. (2001b). "Exchange Rate Policy Options for Post-Crisis Southeast Asia: Is There a Case for Currency Baskets?", The World Economy, forthcoming.

Rajan, R. and R. Siregar (2000). "The Vanishing Intermediate Regime and the Tale of Two Cities: Singapore Versus Hong Kong", Discussion Paper No.0031, Center for International Economic Studies, Adelaide.

Rana, P. (1990). "Shifting Comparative Advantage Among Asian and Pacific Countries", The International Trade Journal, 4, pp.243-258.

Rodrik, D. (1995). "Trade Strategy, Investment and Exports: Another Look at East Asia", Working Paper No.5339, NBER.

Rodrik, D. and A. Velasco (1999). "Short-Term Capital Flows", Working Paper No.7364, NBER.

Rzepkowski, B. (2000). "The Expectations of Hong Kong Dollar Devaluation and their Determinants", Working Paper No.04, CEPII.

Sen, R. (2000). "Analysing International Trade Data in a Small Open Economy: The Case of Singapore", ASEAN Economic Bulletin, 17, pp. 23-35.

Sachs, J., A. Tornell and A. Velasco (1996). "Financial Crises in Emerging Markets: Lessons from 1995", Brookings Papers on Economic Activity, 1, 147-198.

Scharfstein, D. and J. Stein (1990). "Herd Behavior and Investment", American Economic Review, 80, pp.465-79.

Singapore, Department of Statistics, Yearbook of Statistics Singapore, various issues.

Singapore, Trade Development Board. Singapore Trade Statistics, various issues

Singapore, Ministry of Trade and Industry (MTI) (1998). Report on Singapore's Competitiveness, (November).

Singapore, Ministry of Trade and Industry (MTI). Economic Survey of Singapore, various issues.

UNCTAD. International Trade Statistics Yearbook, various issues.

UNCTAD (1999). World Investment Report, 1999, New York.

United States Consulate General Economic/Political Section (1999) in conjunction with the Foreign Commercial Service Section. Hong Kong's 1999 Investment Climate Report.

van Rijckeghem, C. and B. Weder (1999). "Sources of Contagion: Finance or Trade?", Working Paper No.99/146, IMF.

Whitt, J. (1999). "The Role of External Shocks in the Asian Financial Crisis", Economic Review, Federal Reserve Bank of Atlanta, Second Quarter, pp.18-31.

Williamson, J. (1998). "Crawling Band or Monitoring Bands: How to Manage Exchange Rates in a World of Capital Mobility", International Finance, 1, pp.59-79.

Wincoop, van E. and K. Yu (2000). "Asia Crisis Post-Mortem: Where Did the Money Go and Did the US Benefit?", Economic Policy Review, Federal Reserve Bank of New York, 6, pp.3-16.

Wong, J., Yu Ip-wing and E. Law (2000). "Corporate Restructuring in Hong Kong in the Aftermath of the Asian Financial Crisis", Research Memorandum No.RM/14/2000, Hong Kong Monetary Authority.

World Bank (1999). <u>Global Economic Prospects and the Developing Countries</u>, New York: Oxford University Press.

World Bank (2000). <u>East Asia: Recovery and Beyond</u>, New York: Oxford University Press.

Young, A. (1995). "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience", <u>Quarterly Journal of Economics</u>, pp.641-80.

Table 1
Summary of Economic Fundamentals of Selected Asian Economies

Fundamentals	Country Rankings[a]						
	1	2	3	4	5	6	7
External							
International Reserves[b]	P	I	M	T	K	H	S
Current Account/GDP[c]	T	K	M	P	I	H	S
Debt/GDP[d]	T	P	I	M	S	H	S
Export Slowdown[e]	T	S	M	K	H	P	I
Real Exchange Rate: deviation from PPP[f]	S	K	H	M	T	I	P
Banking Strength							
Capital Adequacy[g]	K	T	I	M	P	H	S
Nonperforming Loans[h]	M	T	K	I	P	S	H
Bank Ratings[i]	I	K	T	P	H	M	S
Liquidity Mismatches							
Excess Credit Growth[j]	P	M	T	I	S	K	H
Short-term external debt/Reserves[k]	K	I	T	P	M	H	S
Broad Money/Reserves[l]	T	I	P	K	M	S	H
Overall Average[m]	T	I	K	P	M	S	H
Overall based on Thailand Weights[n]	T	I	K	P	M	S	H

Notes: a) I - Indonesia, H - Hong Kong, K – South Korea, M - Malaysia, P - Philippines, S - Singapore, T - Thailand. Ordinal ranking in descending order of "bad" fundamentals; b) in SDRs, June 1997; c) 1996; d) 1997; e) change (%) in 1996 less the average change (%) previous three years; f) June 1997; g) unclear from source, but probably average of 1996 and 1997; h) 1997 estimates; i) May 1996; j) growth of credit to private sector relative to nominal GDP, 1996; k) June 1997; i) June 1997; m) equal weights to all fundamentals (including two others included in original sources); n) greater weights given to fundamentals in which Thailand is weakest

Source: Goldstein and Hawkins (1998)

	HONG KONG					
	1992	**1993**	**1994**	**1995**	**1996**	**1992-96 (Average)**
Real GDP (percent change)	7.2	6.4	5.4	3.9	4.5	5.5
Real domestic demand (contribution)	9.3	4.9	11.8	7.1	2.5	7.1
Foreign balance (contribution)	n.a	n.a	-5.9	-3.3	1.9	-2.4[a]
Consumer Price	9.3	-14.0	8.1	8.7	6.3	3.7
GDP deflator	9.7	8.5	6.9	2.6	5.9	6.7
Unemployment rate (percent)	2.0	2.0	1.9	3.2	2.8	2.4
Real wages	n.a	n.a	1.3	-1	0.4	0.2[a]
Gross domestic saving (percent of GDP)	33.8	34.6	33.1	30.5	30.7	32.5
Gross domestic investment (percent of GDP)	28.4	27.6	31.9	34.8	32.1	31.0
Government Budget (percent of GDP) (a)						
Revenue	17.3	18.6	17.3	16.7	17.5	17.5
Expenditure	14.5	16.4	16.2	17	15.3	15.9
Consolidated budget balance	2.8	2.1	1.1	-0.3	2.2	1.6
Reserves at March 31	n.a	n.a	14.9	13.7	14.6	14.4[a]
Money and Credit (percent change, end-period)						
Narrow money (M1)	21.1	20.6	-1.2	2.8	14.2	11.5
Broad money (M3)	10.8	16.2	13.6	14.2	10.5	13.0
Loans for use in Hong Kong SAR	n.a	n.a	17	11.1	17.1	15.07[a]
Interest Rates (HIBOR, three month)	n.a	n.a	6.3	5.9	5.5	5.9[a]
Merchandise Trade (percent change)						
Export volume	20.5	13.5	10.4	12	4.8	12.2
Domestic exports	n.a	n.a	-2.3	1.9	-8.4	-2.9[a]
Reexports	n.a	n.a	13.8	14.3	7.5	11.9[a]
Import volume	22.7	12.3	14	13.7	4.3	13.4
Export value	20.8	13.1	11.9	14.9	4	12.9
Import value	22.6	12.3	16.7	19.2	3	14.8
External Indebtedness (in billions of US$, year-end)						
Total outstanding	14.0	17.9	26.8	29.2	38.1	25.2
Short-term	7.6	10.5	18.7	20.1	14.2	14.2
Balance of Payments (in billions of US$)						
Merchandise trade balance	n.a	n.a	-10.9	-19.6	-18.4	-16.3[a]
in percent of GDP	n.a	n.a	-8.4	-14.1	-11.9	-11.5[a]
Current account balance	n.a	n.a	1.6	-6	-2.2	-2.2[a]
in percent of GDP	n.a	n.a	1.2	-4.3	-1.4	-1.5[a]
Foreign exchange reserves (in billions of U.S dollars, end of period	35.2	43.0	49.3	55.4	63.8	49.3
(In months of retained imports)	n.a	n.a	9.9	9.1	10.7	9.9[a]

Notes: a) Fiscal Year

[a] Indicates Average over 1994-96

Source: ADB (2000), IMF, International Financial Statistics, Public Information Notice (Hong Kong) various issues

Table 2b
Selected Economic and Financial Indicators

	SINGAPORE					
	1992	**1993**	**1994**	**1995**	**1996**	**1992-96 (Average)**
Real Economy (percent change)						
Real GDP	6.2	12.6	10.5	8.8	7.5	9.1
Real domestic demand	6.9	14.6	3.2	8.2	12.1	9.0
CPI Inflation	2.3	2.3	3.1	1.7	1.4	2.2
Unemployment rate	2.7	2.7	2.6	2.7	3.0	2.7
Gross national savings (percent of GDP)	45.1	45.2	49.8	50	52	48.4
Gross capital formation (percent of GDP)	36.3	37.8	32.7	33.1	36.8	35.3
Government Budget (percent of GDP) (a)						
Revenue	33.8	36.1	33.1	33.1	36.7	34.6
Expemditure	19.8	17.6	19.9	21.5	27.6	21.3
Overall balance	12.7	15.7	13.2	11.6	8.5	12.3
Primary operating balance (b)	n.a	n.a	8.6	6.1	2.0	5.6[a]
Money and Credit (percent change, end-period)						
Narrow money (M1)	12.7	23.5	2.3	8.2	6.7	10.7
Broad money (M2)	8.9	8.4	14.4	8.5	9.8	10.0
Credit to private sector	8.0	16.9	15.3	20.3	15.8	15.3
Interest rate (three-month interbank, in percent)	n.a	n.a	4.4	2.4	3.4	3.4[a]
Balance of Payments (in billions of US$)						
Exports, f.o.b.	66.6	77.8	95.0	115.5	126	96.2
Imports, f.o.b.	-68.4	-80.6	-96.0	-116.8	-123.8	-97.1
Services and transfers, net	7.7	6.9	13.2	15.7	12.3	11.2
Current account balance	5.9	4.2	11.4	14.4	13.9	10.0
(In percent of GDP)	7.4	4.5	10.7	12.2	15.2	8.7
Overall balance	6.1	7.5	4.8	8.6	7.4	6.9
Gross official reserves	39.9	48.4	58.2	68.8	77.0	58.5
Capital and Financial Account Transactions (US$ billions)						
Capital and financial account balance	1.76	-1.27	-8.88	-4.77	-5.34	-3.7
Capital account (Net)	-0.04	-0.07	-0.08	-0.07	-0.14	-0.1
Financial account (Net)	1.8	-1.2	-8.8	-4.7	-5.2	-3.6
Direct investment	0.887	2.5	3.97	0.925	2.1	2.1
Inflow	2.2	4.7	8.5	7.2	12.7	7.1
Outflow	-1.32	-2.15	-4.6	-6.3	-9.8	-4.8
Other investment	-1.6	1.2	-5.1	1.6	9.5	1.1
Assets	-6.7	-7.1	-11.0	-10.3	-12.9	-9.6
Banks	-5.9	0.77	-4.3	1.15	-5.0	-2.7
Other sectors	-0.82	-7.87	-6.7	-11.4	-7.9	-6.9
Liabilities	5.1	8.3	5.9	11.9	22.3	10.7
Banks	5.1	1.95	5.41	4.42	11.3	5.6
Other sectors	-0.036	6.38	0.51	7.56	11.0	5.1
External Indebtedness (in billions of US$, year-end)						
Total outstanding	4.6	5.6	7.6	8.4	9.9	7.2
Short-term	0.937	0.985	1.02	1.25	2	1.2

Notes: a) Fiscal Year

     b) Overall balance excluding net lending, capital revenue, investment income, debt interest and fund transfers

[a] Indicates Average over 1994-96

Source: ADB (2000), IMF, International Financial Statistics, Public Information Notice (Hong Kong) various issues

Table 3
Net Capital Flows to Singapore, 1989-1997
(percent of GDP)

	1989-95[b]	1991	1992	1993	1994	1995	1996	1997
Private Capital Flows	3.8	1.7	-2.7	9.4	2.5	1.3	-10.1	-5.5
Direct investment	6.0	8.8	2.1	5.5	4.8	4.9	4.3	5.3
Portfolio Investment	0.1	-2.1	3.3	0.5	1.1	0.9	-16.2	-14.4
Other Investment	-2.4	-5.1	-8.0	3.4	-3.4	-4.6	1.8	3.6
Official Flows	--	--	--	--	--	--	--	--
Change in Reserves[a]	-10.3	-9.6	-12.3	-12.9	-6.7	-7.2	-11.1	-14.6

Notes: a) Minus sign denotes a rise and vice versa; b) annual average
Source: IMF (1997)

Table 4
Capital Adequacy Ratios of Banks

Capital / Liquidity Country	Definition	Minimum Ratio	Ranking	Ratio	Forex	Remuneration	Ranking
Singapore	Only Tier 1 eligible	12	1	24%	Watched Closely		5
Hong Kong	70% of revaluation reserves eligible for inclusion. Minimum can be raised up to 12% for licensed banks,16% for restricted license or deposit -taking company;institutions required to observe a 'trigger' 1% above the minimum. Capital requirement for market risk as of late-97.	8	3	25% of liabilities	Watched Closely	Mostly	2
Malaysia	Only Tier 1 in 8%.	8	5	13.5%	No restrictions		8
Korea	Up to 45% of revaluation gains included in Tier 2 capital	8	7	5% on demand, 2% on time			11
Philippines	No Tier 2, unweighted (all at 100%)	10	4	13%			7
Thailand	Tier 2 includes revaluation accounts, provisions, unrealized securities profit/loss, subordinated debt.	8.5	7	7%			8
Indonesia	Sub. Dept up to 50%	8	7	3%			12

Source: Caprio (1998)

Table 5

Liquidity Levels, Loan Structure and Profitability of the Non-Financial Sector in East Asia (a), 1996-98

	Hong Kong	Korea	Malaysia	Philippines	Singapore	Thailand
Current Ratio (b)						
1996	1.45	1.21	1.32	1.61	1.76	1.20
1997	1.57	1.14	1.23	1.29	1.68	0.86
1998	1.42	1.20	1.14	1.40	1.69	0.89
Liquidity Ratio (c)						
1996	1.16	0.99	1.11	1.31	1.55	0.89
1997	1.27	0.95	1.02	1.06	1.45	0.65
1998	1.12	1.02	0.91	1.15	1.48	0.72
Cash Ratio (d)						
1996	0.47	0.28	0.43	0.49	0.82	0.19
1997	0.60	0.26	0.38	0.40	0.58	0.16
1998	0.52	0.27	0.35	0.38	0.68	0.23
ST loan/Total loan (%)						
1996	34.8	48	48.9	39.7	40.1	39.3
1997	31	47.7	46.9	37.1	38.3	42.9
1998	31.4	41.4	43.4	29.7	34.4	48.5
Interest Burden (%)						
1996	13.7	68.9	18.2	14.7	19.9	36.00
1997	15.6	75.00	28.9	26.6	24.4	33.00
1998	32.6	109.2	78.9	35.5	34.6	190.8
Profit Margin (%) (e)						
1996	25.1	8.1	22.5	14.7	18.1	20
1997	24.5	8.6	15.6	26.6	18	32.8
1998	15	8.4	13.1	24.2	14.4	19.6
Return on Equity (%)						
1996	10.1	2.5	13	13.3	9.3	10
1997	9.9	-7.5	7.9	9.1	8.4	12.3
1998	3	-6.8	-5.1	5.1	2.4	5
Return on Assets (%)						
1996	6.1	0.4	4.5	6.6	2.9	2.4
1997	5.7	-1.4	2.8	3.7	2.9	5.6
1998	1.1	-2.7	-3.1	1.9	1	-3.3

Notes: a) Based on samples ranging generally from 300 to 500 firms

      b) Current ratio = Current assets/Current liabilities

      c) Liquidity ratio = Current assets (exc. Inventory)/Current liabilities

      d) Cash ratio = (Cash + Marketable securities)/Current liabilities

      e) Profit margin = earnings before interest, taxes, depreciation and amortization/sales

Source: Wong et al. (2000)

Table 6a
Selected Economic and Financial Indicators

	HONG KONG				
	1996	**1997**	**1998**	**1999**	**2000 Est**
Real GDP (percent change)	4.5	5.0	-5.3	3.1	10.0
Real domestic demand (contribution)	2.5	8.4	-10.3	-5.0	9.0
Foreign balance (contribution)	1.9	-3.4	5.0	8.1	1.0
Consumer Price	6.3	5.8	2.8	-4.0	-3.7
GDP deflator	5.9	5.8	0.6	-5.3	-6.3
Unemployment rate (percent)	2.8	2.2	4.7	6.3	5.0
Real wages	0.4	1.0	0.1	3.8	..
Gross domestic saving (percent of GDP)	30.7	31.3	30.4	30.7	31.9
Gross domestic investment (percent of GDP)	32.1	34.4	29.0	25.1	26.4
Government Budget (percent of GDP) (a)					
Revenue	17.5	21.2	17.1	18.9	18.9
Expenditure	15.3	14.7	19.0	18.1	19.1
Consolidated budget balance	2.2	6.6	-1.8	0.8	-0.2
Reserves at March 31	14.6	34.6	34.4	36.0	34.8
Money and Credit (percent change, end-period)					
Narrow money (M1)	14.2	-4.3	-5.0	13.9	..
Broad money (M3)	10.5	8.2	10.5	7.7	..
Loans for use in Hong Kong SAR	17.1	24.4	-3.8	-7.2	..
Interest Rates (HIBOR, three month)	5.5	9.1	5.1	5.7	..
Merchandise Trade (percent change)					
Export volume	4.8	6.1	-4.3	3.7	16.7
Domestic exports	-8.4	2.2	-7.9	-7.2	6.1
Reexports	7.5	6.8	-3.7	5.4	18.2
Import volume	4.3	7.2	-7.1	0.2	14.8
Export volume	4	4.2	-7.4	0.1	16.7
Import value	3	4.9	-11.5	-2.5	17.9
External Indebtedness (in billions of US$, year-end)					
Total outstanding	38.1	40.4	48.7	..	..
Short-term	14.2	10.3	10.4	..	..
Balance of Payments (in billions of US$)					
Merchandise trade balance	-18.4	-17.3	-7.8	-3.2	-6.3
in percent of GDP	-11.9	-10.1	-4.8	-2.0	-3.8
Current account balance	-2.2	-6.2	3.9	10.5	9.6
in percent of GDP	-1.4	-3.6	2.4	6.6	5.9
Foreign exchange reserves (in billions of U.S dollars, end of period	63.8	92.8	89.6	96.3	107.5
(In months of retained imports)	10.7	14.6	17.1	19.8	..

Notes: a) Fiscal Year

Source: ADB (2000), IMF, *Public Information Notice* (Hong Kong), various issues

Table 6b
Selected Economic and Financial Indicators

	SINGAPORE				
	1996	**1997**	**1998**	**1999**	**2000 Est**
Real Economy (percent change)					
Real GDP	7.5	8.4	0.4	5.4	9.9
Real domestic demand	12.1	10.2	-7.3	6.5	..
CPI Inflation	1.4	2.0	-0.3	0	..
Unemployment rate	2.0	1.8	3.2	3.5	..
Gross national savings (percent of GDP)	52	57.2	58.2	57.8	..
Gross capital formation (percent of GDP)	36.8	39.3	32.8	32.8	..
					..
Government Budget (percent of GDP) (a)					
Revenue and grants	36.7	36.6	30.1	28.8	..
Expemditure, net lending, and fund transfers	27.6	26.5	29.1	24.9	..
Overall balance	8.5	9.5	1.6	3.9	..
Primary operating balance (b)	2.0	3.9	0.5	1.9	..
Money and Credit (percent change, end-period)					
Narrow money (M1)	6.7	1.7	-1	14.2	..
Broad money (M2)	9.8	10.3	30.2	8.5	..
Credit to private sector	15.8	12.7	8.0	-3	..
Interest rate (three-month interbank, in percent)	3.4	6.6	1.6	2.6	..
					..
Balance of Payments (in billions of US$)					
Exports, f.o.b.	126	125.7	110.6	115.6	..
Imports, f.o.b.	-123.8	-124.6	-95.8	-104.3	..
Services and transfers, net	12.3	13.9	2.9	..	..
Current account balance	13.9	16.9	21.0	21.3	..
(In percent of GDP)	15.2	17.9	25.4	25	..
Overall balance	7.4	8.0	3.0	4.3	..
Gross official reserves	77.0	71.4	75.0	77.2	..
Capital and Financial Account Transactions (US$ billions)					
Capital and financial account balance	-7.5	-19.9	-36	-29.7	..
Capital account (Net)	-4.4	-3.2	-2.9	-1.4	..
Financial account (Net)	-3.2	-16.7	-33.1	-28.3	..
Direct investment	2.9	-1.1	11.7	5.1	..
Inflow	12.7	12	9.1	11.8	..
Outflow	-9.8	-13.1	2.5	-6.7	..
Other investment	9.5	3.6	-31.7	-21.5	..
Assets	-12.9	-50	-5.2	-29.3	..
Banks	-5.0	-18.4	3.7	-18.1	..
Other sectors	-7.9	-31.6	-8.9	-11.1	..
Liabilities	22.3	53.6	-26.5	7.8	..
Banks	11.3	27.7	-21.4	5.5	..
Other sectors	11.0	25.8	-5.1	2.3	..
External Indebtedness (in billions of US$, year-end)					
Total outstanding	9.9	13.8	14.2	..	..
Short-term	2	2.8	2.7	..	..

Notes: a) Fiscal Year

     b) Overall balance excluding net lending, capital revenue, investment income, debt interest and fund transfers

Source: ADB (2000), IMF (2000), IMF, *Public Information Notice* (Singapore), various issues

Table 7
Trends in Hong Kong's Trade with Singapore and the Asia-5 Economies, 1991-99 (US $ million)

Malaysia

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Share in HK total	Amount	Gr.	Share in HK total	Amount	Gr.	Share in HK total	Amount	Gr.	Share in HK total	Share of 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 HK total	Amount	Gr.	Share in HK total	Amount	Gr.	Share in HK total	Amount	Gr.	Share in HK total	Share of 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 HK total	Amount	Gr.	Share in HK total	Amount	Gr.	Share in HK total	Amount	Gr.	Share in HK total	Share of 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 HK total	Amount	Gr.	Share in HK total	Amount	Gr.	Share in HK total	Amount	Gr.	Share in HK total	Share of 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

Korea

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Share in HK total	Amount	Gr.	Share in HK total	Amount	Gr.	Share in HK total	Amount	Gr.	Share in HK total	Share of 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 HK total	Amount	Gr.	Share in HK total	Amount	Gr.	Share in HK total	Amount	Gr.	Share in HK total	Share of 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

Hong Kong, Total

	Imports			Domestic Exports			Re-exports			Exports			
			Combined Share			Combined Share			Combined Share			Combined Share	Share of Re-exports
	Amount	Gr.	HK total	Amount	Gr.	HK total	Amount	Gr.	HK total	Amount	Gr.	HK total	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 : Census and Statistics Department, Hong Kong, *Annual Review of Hong Kong External Trade* , various issues

Gr: Indicates Growth over the previous year

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

Table 8
Trends in Singapore's Trade with Hongkong and the Asia-5 Economies, 1991-99 (US $ million)

Malaysia

	Imports			Domestic Exports			Re-exports			Exports			
	Amount	Gr.	Share in SG total	Amount	Gr.	Share in SG total	Amount	Gr.	Share in SG total	Amount	Gr.	Share in SG 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 SG total	Amount	Gr.	Share in SG total	Amount	Gr.	Share in SG total	Amount	Gr.	Share in SG total	Share of Re-exports in Total exports
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 SG total	Amount	Gr.	Share in SG total	Amount	Gr.	Share in SG total	Amount	Gr.	Share in SG 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 SG total	Amount	Gr.	Share in SG total	Amount	Gr.	Share in SG total	Amount	Gr.	Share in SG 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

HongKong

| | Imports | | | Domestic Exports | | | Re-exports | | | Exports | | | |
	Amount	Gr.	Share in SG total	Amount	Gr.	Share in SG total	Amount	Gr.	Share in SG total	Amount	Gr.	Share in SG 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

Singapore

| | Imports | | | Domestic Exports | | | Re-exports | | | Exports | | | |
	Amount	Gr.	Combined share SG total	Amount	Gr.	Combined share SG total	Amount	Gr.	Combined share SG total	Amount	Gr.	Combined share SG 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: 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 previous year

Singapore: Inward Stock of Foreign Direct Investment by Country of Origin (US $ billions)

	1987	1992	1995	1997	1987	1992	1995	1997	1987-92	1992-95	1995-97
	Amount				Shares in total				C.A.G.R		
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
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 denotes the Coumpound Annual growth rate

Singapore: Stock of Foreign Direct Equity Investment Abroad by Host Country (US $ billions)

	1992	1995	1997	1992	1995	1997	1992-95	1995-97
	Amount			Shares in total			C.A.G.R	
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	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
ASEAN	3.0	9.2	9.0	27.6	33.2	24.8	44.9	-1.1
Total Direct Equity Investr	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 denotes the Coumpound Annual growth rate

Table 10a
Hong Kong Total Value of Net Assets at Historical Costs Attributed to Inward Foreign Direct Investment by Country (US$ billions)

Country	1994	1995	1996	1997	1994	1995	1996	1997	1995	1996	1997
	Amount				Share in total				Growth rate		
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							

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

Table 10b
Hong Kong Overseas Direct Investment in Selected Economies As of May 1997 (US$ billions)

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.

Table 11

Measures of Trade linkage Statistics due to Crisis Originating in the East Asian Economies

	Thailand (1997)	Indonesia (1997)	Korea (1997)	Philippines (1997)
		Crisis originating countries		
	Competitiveness Effect			
Hong Kong	7.24	4.24	12.88	4.28
Singapore	60.04	23.22	100.00	27.60
	Cheap-Import Effect			
Hong Kong	2.15	1.14	7.60	0.67
Singapore	10.20	n.a	6.42	1.98

Source : Adapted from Forbes (2000)

Table 12
Variable Descriptions

Variable	Definition	Source
exhkind	Hong Kong's Export to Indonesia	IMF, *Direction of Trade Statistics.*
exhkmal	Hong Kong's Export to Malaysia	IMF, *Direction of Trade Statistics.*
exsgmal	Singapore's Export to Malaysia	IMF, *Direction of Trade Statistics.*
exhkphi	Hong Kong's Export to Philippines	IMF, *Direction of Trade Statistics.*
exsgphi	Singapore's Export to Philippines	IMF, *Direction of Trade Statistics.*
exhkor	Hong Kong's Export to Korea	IMF, *Direction of Trade Statistics.*
exsgkor	Singapore's Export to Korea	IMF, *Direction of Trade Statistics.*
exhkthai	Hong Kong's Export to Thailand	IMF, *Direction of Trade Statistics.*
exsgthai	Singapore's Export to Thailand	IMF, *Direction of Trade Statistics.*
exhksg	Hong Kong's Export to Singapore	IMF, *Direction of Trade Statistics.*
exsghk	Singapore's Export to Hong Kong	IMF, *Direction of Trade Statistics.*
gdphk	GDP of Hong Kong	Hong Kong Monetary Authority
gdpind	GDP of Indonesia	Central Bureau of Statistics, Indonesia
gdpmal	GDP of Malaysia	Bank Negara Malaysia
gdpkor	GDP of Korea	IFS, CD Roam and Central Bank of Korea
gdpthai	GDP of Thailand	IFS, CD Roam and Central Bank of Thailand
gdpsg	GDP of Singapore	IFS, CD Roam and Monetary Authority of Singapore
tothkind	Terms of Trade of Hong Kong's Products to Indonesia	Authors' own calculation. Raw data are from IFS, IMF.
tothkmal	Terms of Trade of Hong Kong's Products to Malaysia	Authors' own calculation. Raw data are from IFS, IMF.
totsgmal	Terms of Trade of Singapore's Products to Malaysia	Authors' own calculation. Raw data are from IFS, IMF.
tothkkor	Terms of Trade of Hong Kong's Products to Korea	Authors' own calculation. Raw data are from IFS, IMF.
totsgkor	Terms of Trade of Singapore's Products to Korea	Authors' own calculation. Raw data are from IFS, IMF.
tothkthai	Terms of Trade of Hong Kong's Products to Thailand	Authors' own calculation. Raw data are from IFS, IMF.
totsgthai	Terms of Trade of Singapore's Products to Thailand	Authors' own calculation. Raw data are from IFS, IMF.
tothksg	Terms of Trade of Hong Kong's Products to Singapore	Authors' own calculation. Raw data are from IFS, IMF.
totsghk	Terms of Trade of Singapore's Products to Hong Kong	Authors' own calculation. Raw data are from IFS, IMF.

Table 13
ADF Unit-Root Test
(all variables in log forms)

Variable	ADF-statistics (X_t)	ADF-statistics ($X_t - X_{t-1}$)
Exhkind	-2.6292 (lags = 6) [a, d]	-5.5809 (lags = 2) [a, e, b]
Exhkmal	-1.8791 (lag = 1) [a, d]	-2.9549 (lags = 2) [a, e, b]
Exsgmal	-2.1659 (lag = 1) [a, d]	-5.3112 (lag=1) [a, e, b]
Exhkphi		
Exsgphi		
Exhkor	-2.1471 (lags =6) [a, f]	-3.3941 (lags = 2) [a, d, c]
Exsgkor	-3.1423 (lags = 5) [a, d]	-3.3722 (lags = 5) [a, e, b]
Exhkthai	-2.1313 (lags = 4) [a, d]	-2.5216 (lags = 4) [a, e, b]
Exsgthai	-3.4040 (lags = 4) [a, d]	-3.1809 (lag = 1) [a, e, b]
Exhksg	-2.5123 (lags = 4) [a, d]	-4.2746 (lags = 2) [a, d, b]
Exsghk		
Gdphk		
Gdpind	-1.7752 (lag = 1) [a, d]	-5.6738 (lag = 1) [a, f, b]
Gdpmal	2.1011 (lag = 1) [a, f]	-3.3944 (lag = 1) [a, f, b]
Gdpkor	-1.6919 (lags = 4) [a, f]	-1.9219 (lag = 1) [a, e, c]
Gdpthai	-1.8938 (lags = 6) [a, d]	-4.2947 (lag = 1) [a, f, b]
gdpsg	-1.4644 (lag = 1) [a, d]	-4.2345 (lag = 1) [a, f, b]
Tothkind	-2.0254 (lag = 1) [a, e]	-6.8569 (lag = 1) [a, e, b]
Tothkmal	-1.3584 (lags = 4) [a, e]	-5.5939 (lags = 2) [a, e, b]
Totsgmal	-2.6146 (lag = 1) [a, f]	-4.7909 (lag = 1) [a, e, b]
Tothkkor	-0.7774 (lags = 2) [a, e]	-2.9269 (lags = 2) [a, e, b]
Totsgkor	-0.6139 (lags = 4) [a, e]	-4.9959 (lags = 3) [a, d]
Tothkthai	-1.9386 (lag = 1) [a, e]	-4.9049 (lag = 1) [a, e, b]
Totsgthai	-2.1591 (lag = 4) [a, e]	-4.2087 (lags = 4) [a, e, b]
tothksg	-1.9452 (lags = 5) [a, e]	-4.2087 (lags = 4) [a, e, b]
Totsghk		

[a]/ number of lags is determined by the Akaike Information Criterion
[b]/ the series are found to be an integrated of order (1) series (I(1)) at 5% critical value
[c]/ the series are found to be an integrated of order (1) series (I(1)) at 10% critical value
[d]/ drift and time trend are included in the test
[e]/ drift and time trend are not included in the test. [f]/ only drift is included

Table 14a
Hong Kong's Exports to Indonesia

Sample: Quarter 1, 1983 - Quarter 2, 1997
(# of lags based on Akaike Information Criteria = 3)

Eigenvalue	Likelihood Ratio	5 Percent Critical Value
0.4364	45.73[a]	29.68
0.2201	14.76	15.41
0.0245	1.34	3.76

[a]/ Likelihood Ratio indicates 1 cointegrating equation at 5% significant level

Normalized Cointegrating Coefficients:

exhkind = -5.045 + 0.978 gdpind - 1.347 tothkind
                         (0.171)   (0.339)

( ) are the standard errors; Log Likelihood Ratio = 222.25

Table 14b
Hong Kong's Exports to Malaysia

Sample: Quarter 1, 1981 - Quarter 1, 1996
(# of lags based on Akaike Information Criteria = 5)

Eigenvalue	Likelihood Ratio	5 Percent Critical Value
0.331	29.99 [a]	29.68
0.128	7.88	15.41
0.006	0.34	3.76

[a]/ Likelihood Ratio indicates 1 cointegrating equation at 5% significant level

Normalized Cointegrating Coefficients:

exhkmal = -5.148 + 2.186 gdpmal + 0.068 tothkmal
                         (0.048)   (0.059)

( ) are the standard errors; Log Likelihood Ratio = 335.5

Table 14c
Hong Kong's Exports to Korea

Sample: Quarter 1, 1981 - Quarter 2, 1997
(# of lags based on Akaike Information Criteria = 4)

Eigenvalue	Likelihood Ratio	5 Percent Critical Value
0.359	35.44 [a]	29.68
0.127	8.30	15.41
0.001	0.045	3.76

[a]/ Likelihood Ratio indicates 1 cointegrating equation at 5% significant level

Normalized Cointegrating Coefficients:

$exhkor = 6.336 + 1.599\ gdpkor - 6.763\ tothkkor$
$\qquad\qquad\quad (0.240)\qquad\quad (2.375)$

( ) are the standard errors; Log Likelihood Ratio = 406.3

Table 14d
Hong Kong's Exports to Thailand

Sample: Quarter 1, 1981 - Quarter 2, 1997
(# of lags based on Akaike Information Criteria = 6)

Eigenvalue	Likelihood Ratio	5 Percent Critical Value
0.329	34.63 [a]	29.68
0.132	11.09	15.41
0.045	2.712	3.76

[a]/ Likelihood Ratio indicates 1 cointegrating equation at 5% significant level

Normalized Cointegrating Coefficients:

$exhkthai = -5.170 + 2.235\ gdpthai - 1.155\ tothkthai$
$\qquad\qquad\qquad (0.244)\qquad\quad (0.593)$

( ) are the standard errors; Log Likelihood Ratio = 294.2

Table 14e
Hong Kong's Exports to Singapore

Sample: Quarter 1, 1981 - Quarter 2, 1997
(# of lags based on Akaike Information Criteria = 2)

Eigenvalue	Likelihood Ratio	5 Percent Critical Value
0.309	34.67 [a]	29.68
0.158	11.01	15.41
0.000	0.01	3.76

[a]/ Likelihood Ratio indicates 1 cointegrating equation at 5% significant level

Normalized Cointegrating Coefficients:

$exhksg = -21.942 + 2.878 \ gdpsg - 4.317 \ tothksg$
$(0.632) \quad\quad (2.585)$

( ) are the standard errors; Log Likelihood Ratio = 426.01

Table 15a
Singapore's Exports to Malaysia

Sample: Quarter 1, 1981 - Quarter 1, 1996
(# of lags based on Akaike Information Criteria = 6)

Eigenvalue	Likelihood Ratio	5 Percent Critical Value
0.347	30.09 [a]	29.68
0.122	7.07	15.41
0.000	0.03	3.76

[a]/ Likelihood Ratio indicates 1 cointegrating equation at 5% significant level

Normalized Cointegrating Coefficients:

exsgmal = -0.846 + 1.857 gdpmal – 1.374 totsgmal
                         (0.096)   (0.239)

( ) are the standard errors; Log Likelihood Ratio = 330.7

Table 15b
Singapore's Exports to Korea

Sample: Quarter 1, 1981 - Quarter 2, 1997
(# of lags based on Akaike Information Criteria = 8)

Eigenvalue	Likelihood Ratio	1 Percent Critical Value
0.349	41.62 [a]	35.65
0.212	17.17	20.04
0.061	3.61	6.65

[a]/ Likelihood Ratio indicates 1 cointegrating equation at 1% significant level

Normalized Cointegrating Coefficients:

exsgkor = 4.699 + 1.264 gdpkor – 3.971 totsgkor
                         (0.385)   (7.03)

( ) are the standard errors; Log Likelihood Ratio = 337.7

Table 15c
Singapore's Exports to Thailand

Sample: Quarter 1, 1981 - Quarter 2, 1997
(# of lags based on Akaike Information Criteria = 1)

Eigenvalue	Likelihood Ratio	5 Percent Critical Value
0.384	42.73 [a]	29.68
0.165	11.68	15.41
0.003	0.17	3.76

[a]/ Likelihood Ratio indicates 1 cointegrating equation at 5% significant level

Normalized Cointegrating Coefficients:

exsgthai = -1.722 + 1.790 gdpthai – 0.308 totsgthai
                         (0.131)   (0.115)

( ) are the standard errors; Log Likelihood = 169.5

Table 15d
Singapore's Exports to Hong Kong

Sample: Quarter 2, 1985 - Quarter 2, 1997
(# of lags based on Akaike Information Criteria = 2)

Eigenvalue	Likelihood Ratio	1 Percent Critical Value
0.451	46.12	35.65
0.299	18.52	20.04
0.047	2.19	6.65

[a]/ Likelihood Ratio indicates 1 cointegrating equation at 1% significant level

Normalized Cointegrating Coefficients:

exsghk = -41.09 + 4.02 gdphk – 2.45 totsghk
                        (0.20)   (1.62)

( ) are the standard errors; Log Likelihood = 310.44

Table 16a
Hong Kong's Aggregate Demand

Sample: Quarter 2, 1985 - Quarter 2, 1997
(# of lags based on Akaike Information Criteria = 2)

Eigenvalue	Likelihood Ratio	5 Percent Critical Value
0.5715	56.07 [a]	47.21
0.1729	17.09	29.68
0.15	8.35	15.41
0.019	0.87	3.76

[a]/ Likelihood Ratio indicates 1 cointegrating equation at 5% significant level

Normalized Cointegrating Coefficients:

gdphk = 8.55 + 0.38 exhkkor + 0.09 exhkphi + 0.08 exhksg
                    (0.09)   (0.07)   (0.08)

(   ) standard errors; Log Likelihood Ratio = 369.09

Table 16b
Singapore's Aggregate Demand

Sample: Quarter 1, 1981 - Quarter 2, 1997
(# of lags based on Akaike Information Criteria = 5)

Eigenvalue	Likelihood Ratio	5 Percent Critical Value
0.5003	70.99 [a]	54.46
0.3122	32.14	35.65
0.1776	11.18	20.04
0.0041	0.23	6.65

[a]/ Likelihood Ratio indicates 1 cointegrating equation at 1% significant level

Normalized Cointegrating Coefficients:

gdpsg = 7.007 + 0.2153 exsghk + 0.1197 exsgmal + 0.0567 exsgthai
                      (0.0506)   (0.0430)   (0.0300)

(   ) standard errors; Log Likelihood = 376.6

Table 17
Direct Trade Effect of East Asian Economic Slowdown 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	Export[b] growth Rate	Malaysia's GDP growth rate	Export[b] growth rate	Malaysia's GDP Growth rate	Direct Impact to Hong Kong Economy[c]
0.99%	-4.32%	7.54%	-21.9%	-7.50%	0.17%
Case B:	**Pre-Slowdown Period (1997)**		**Slowdown Period (1998)**		
To Philippines	Export[b] growth Rate	Philippines' GDP growth rate	Export[b] growth rate	Philippines' GDP Growth rate	Direct Impact to Hong Kong Economy[c]
1.27%	-3.1%	5.16%	-25.2%	-0.54%	0.28%
Case C:	**Pre-Slowdown Period (1997)**		**Slowdown Period (1998)**		
To Thailand	Export[b] growth Rate	Thailand's GDP growth rate	Export[b] growth rate	Thailand's GDP Growth rate	Direct Impact to Hong Kong Economy[c]
1.07%	-3.2%	-1.75%	-21.9%	-10.36%	0.20%
Case D:	**Pre-Slowdown Period (1997)**		**Slowdown Period (1998)**		
To Korea	Export[b] growth Rate	Korea's GDP growth rate	Export[b] growth rate	Korea's GDP Growth rate	Direct Impact to Hong Kong Economy[c]
1.61%	-10.6%	5.01%	-37.1%	-5.84%	0.43%
Case E:	**Pre-Slowdown Period (1997)**		**Slowdown Period (1998)**		
To Indonesia	Export[b] growth Rate	Indonesia's GDP growth rate	Export[b] growth rate	Indonesia's GDP Growth rate	Direct Impact to Hong Kong Economy[c]
0.53%	-14.5%	4.70%	-44.3%	-13.20%	0.16%
Case F:					
To Singapore	Export[b] growth Rate	Hong Kong's GDP growth rate	Export[b] growth rate	Hong Kong's GDP Growth rate	Direct Impact to Hong Kong Economy[c]
2.8%	-6.8%	8.91%	-20.5%	0.25%	0.38%

Source: Authors' calculations

Table 18
Direct Trade Effect of East Asian Economic Slowdown 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	Export[b] growth Rate	Malaysia's GDP growth rate	Export[b] growth rate	Malaysia's GDP Growth rate	Direct Impact to Singapore Economy[c]
22.9%	2.04%	7.54%	-12.6%	-7.5%	3.35%
Case B:	Pre-Slowdown Period (1997)		Slowdown Period (1998)		
To Philippines	Export[b] growth Rate	Philippines' GDP growth rate	Export[b] growth rate	Philippines' GDP Growth rate	Direct Impact to Singapore Economy[c]
4.8%	35.15%	5.16%	-4.45%	-0.54%	1.9%
Case C:	Pre-Slowdown Period (1997)		Slowdown Period (1998)		
To Thailand	Export[b] growth Rate	Thailand's GDP growth rate	Export[b] growth rate	Thailand's GDP Growth rate	Direct Impact to Singapore Economy[c]
6.04%	-14.3%	-1.75%	-16.9%	-10.36%	0.16%
Case D:	Pre-Slowdown Period (1997)		Slowdown Period (1998)		
To Korea	Export[b] growth Rate	Korea's GDP growth rate	Export[b] growth rate	Korea's GDP Growth rate	Direct Impact to Singapore Economy[c]
3.9%	-17.6%	5.01%	-20.6%	-5.84%	0.12%
Case E:	Pre-Slowdown Period (1997)		Slowdown Period (1998)		
To Hong Kong	Export[b] growth Rate	Hong Kong's GDP growth rate	Export[b] growth rate	Hong Kong's GDP Growth rate	Direct Impact to Singapore Economy[c]
11.7%	23.6%	5.26%	-12.4%	-5.13%	4.2%

Source: Authors' calculations

Table 19
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	US	0.18	ROECD[b]	1.11
US	0.21	US	0.21	Malaysia	0.18	US	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
Philippines	0.01	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	Philippines	0.02	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 normalized by setting "own country" multipliers to unity. Export shares are based on the 1996 export matrix
b) OECD Economies excluding the US and Japan

Source: Abeysinghe and Forbes (2001)

Table 20
Analysis of Aggregate Export Revealed Comparative Advantage (XRCA) among Hong Kong, Singapore and the Asia-5 Economies+A2
Based on the Anderson-Garnaut Product Classification by Relative Factor Intensities

UNSKILLED LABOUR INTENSIVE GOODS

Countries	RCA	1982	1987	1992	1996
Hong Kong	RCA >1	7.09	4.48	3.81	3.54
	RCA <1	_	_	_	_
SINGAPORE	RCA >1	_	_		
	RCA <1	0.82	0.81	0.64	0.43
INDONESIA	RCA >1	_	_	1.88	1.73
	RCA <1	0.10	0.57	_	_
Korea	RCA >1	4.97	3.70	2.94	2.25
	RCA <1	_	_	_	_
THAILAND	RCA >1	1.60	2.04	2.08	1.97
	RCA <1	_	_	_	_
MALAYSIA	RCA >1	_	_	_	_
	RCA <1	0.28	0.37	0.77	0.73
PHILIPPIN	RCA >1	1.62	1.16	1.36	1.54
	RCA <1	_	_	_	_

PHYSICAL CAPITAL INTENSIVE GOODS

Countries	RCA	1982	1987	1992	1996
Hong Kong	RCA >1	_	_	_	_
	RCA <1	0.29	0.34	0.47	0.52
SINGAPORE	RCA >1	_	_	_	_
	RCA <1	0.67	0.54	0.69	0.62
INDONESIA	RCA >1	_	_	_	_
	RCA <1	0.11	0.20	0.17	0.24
Korea	RCA >1	_	_	_	_
	RCA <1	0.59	0.53	0.69	0.68
THAILAND	RCA >1	_	_	_	_
	RCA <1	0.37	0.20	0.30	0.39
MALAYSIA	RCA >1	_	_	_	_
	RCA <1	0.48	0.19	0.35	0.37
PHILIPPIN	RCA >1	_	_	_	_
	RCA <1	0.19	0.35	0.17	0.15

TECHNOLOGY INTENSIVE GOODS

Countries	RCA	1982	1987	1992	1996
Hong Kong	RCA >1	1.45	1.16	1.07	1.18
	RCA <1	_	_	_	_
SINGAPORE	RCA >1	1.54	2.15	2.56	2.69
	RCA <1	_	_	_	_
INDONESIA	RCA >1	_	_	_	_
	RCA <1	0.05	0.05	0.23	0.44
Korea	RCA >1	1.06	1.16	1.40	1.54
	RCA <1				
THAILAND	RCA >1	_	_	1.15	1.23
	RCA <1	0.47	0.59	_	_
MALAYSIA	RCA >1	_	_	1.45	1.45
	RCA <1	0.55	0.65	_	_
PHILIPPIN	RCA >1	_	_	_	2.42
	RCA <1	0.27	0.20	0.91	_

HUMAN CAPITAL INTENSIVE GOODS

Countries	RCA	1982	1987	1992	1996
Hong Kong	RCA >1	1.07	_	_	_
	RCA <1	_	0.64	0.62	0.62
SINGAPORE	RCA >1	_	_	_	_
	RCA <1	0.43	0.33	0.34	0.35
INDONESIA	RCA >1	_	_	_	_
	RCA <1	0.02	0.06	0.18	0.35
Korea	RCA >1	1.42	_	_	1.19
	RCA <1	_	0.93	0.89	_
THAILAND	RCA >1	_	_	_	_
	RCA <1	0.18	0.30	0.42	0.51
MALAYSIA	RCA >1	_	_	_	_
	RCA <1	0.05	0.09	0.29	0.32
PHILIPPIN	RCA >1	_	_	_	_
	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 21
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

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

Table 22
Correlations of East Asian Manufactured Export Structures, 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)

Table 23
Currency Weights of Southeast Asian Countries, 1979-1995

Currency	Frankel and Wei (1994)[a]		Kwan (1995)[b]	
	US dollar	Japanese yen	US dollar	Japanese yen
Indonesian rupiah	0.95	0.16	0.99	0.00
Malaysian ringgit	0.78	0.07	0.84	0.04
Philippine peso	1.07	-0.01	1.15	-0.24
Singapore dollar	0.75	0.13	0.64	0.11
Thai baht	0.91	0.05	0.82	0.11
Simple Average	0.89	0.08	0.88	0.00

Notes: a) Based on weekly movements for the period January 1979 to May 1992
     b) Based on weekly movements for the period January 1991 to May 1995

Figure 1a: Year-on-Year Growth in Residential Property Prices
(percent)
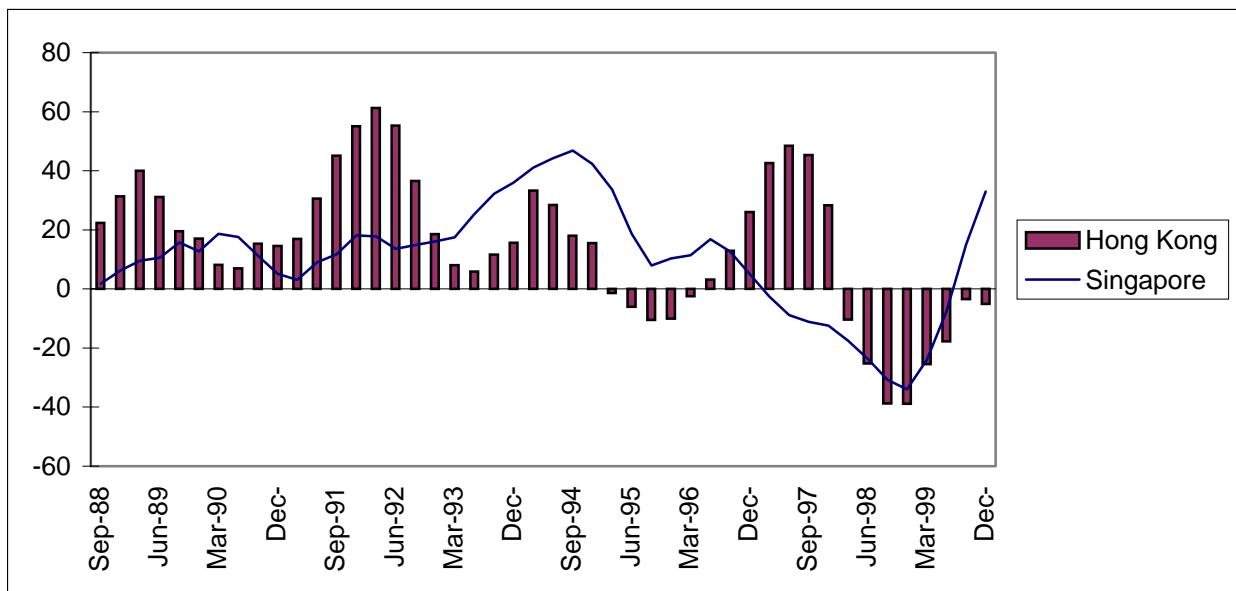
Source: CEIC database

Figure 1b: Year-on-Year Growth in Office Property Prices
(percent)
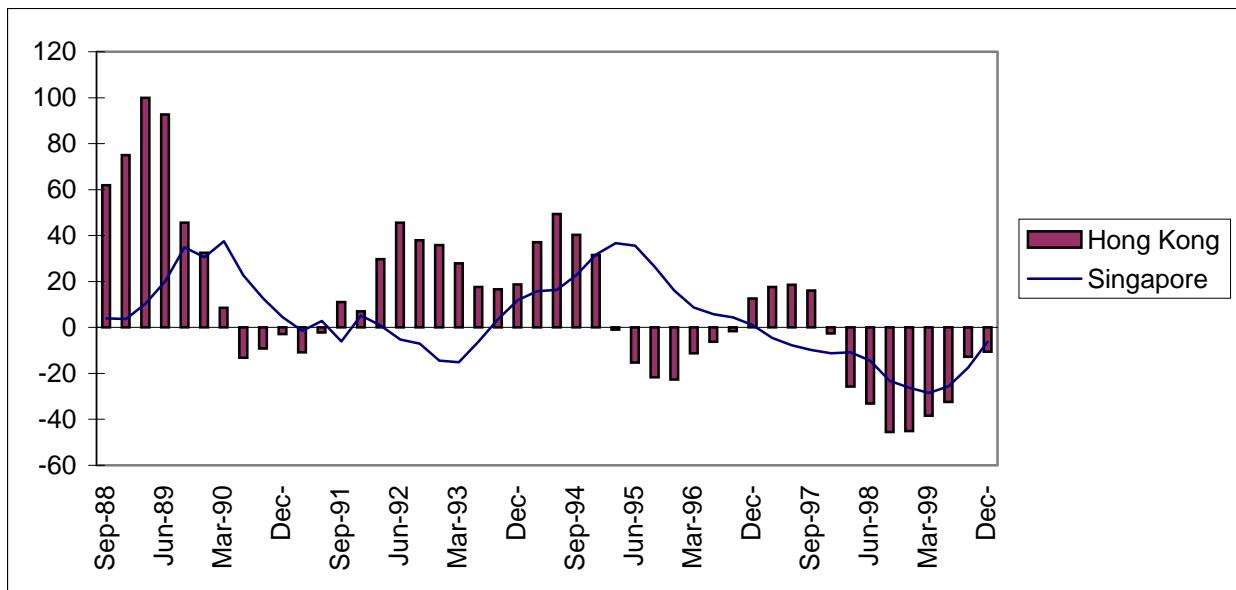
Source: CEIC database

Figure 2a: The Hong Kong Hang Seng Index
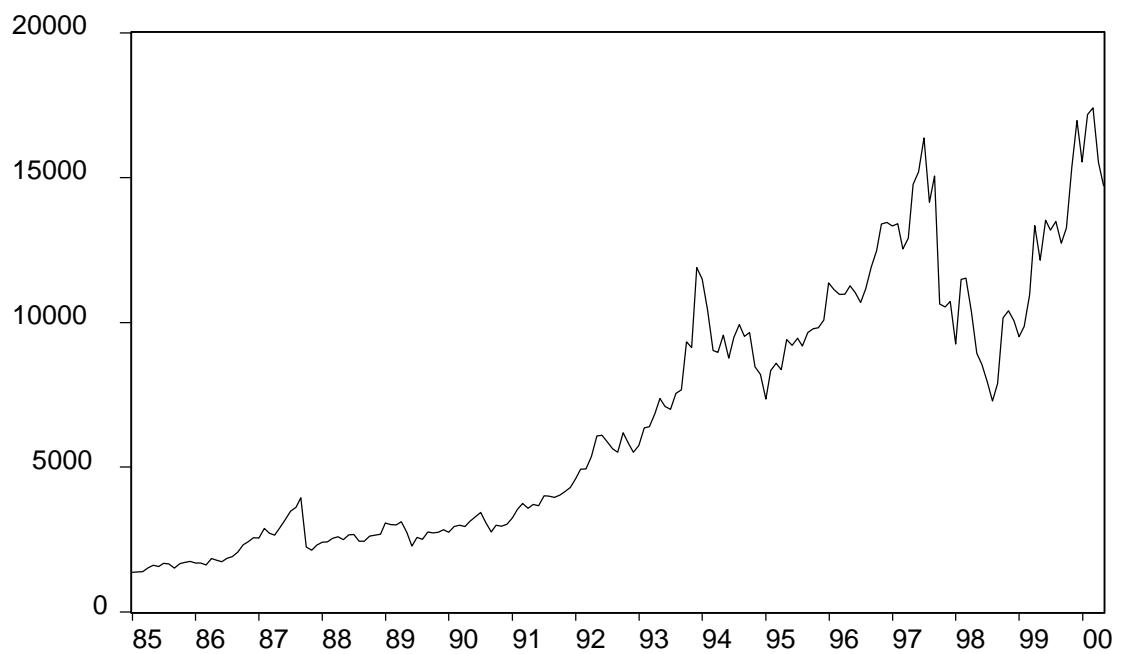
Figure 2b: The Singapore Straits Time Index
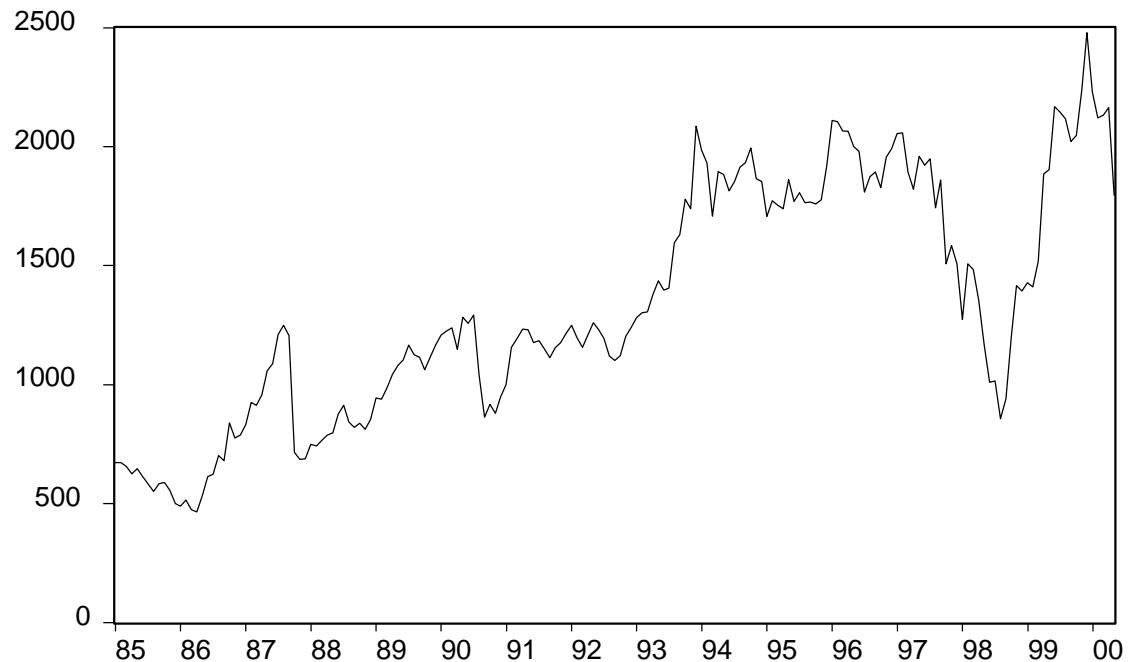
**Figure 3a: Hong Kong Nominal Effective Exchange Rate (NEER)
and Real Effective Exchange Rate (REER) (1990 = 100)**
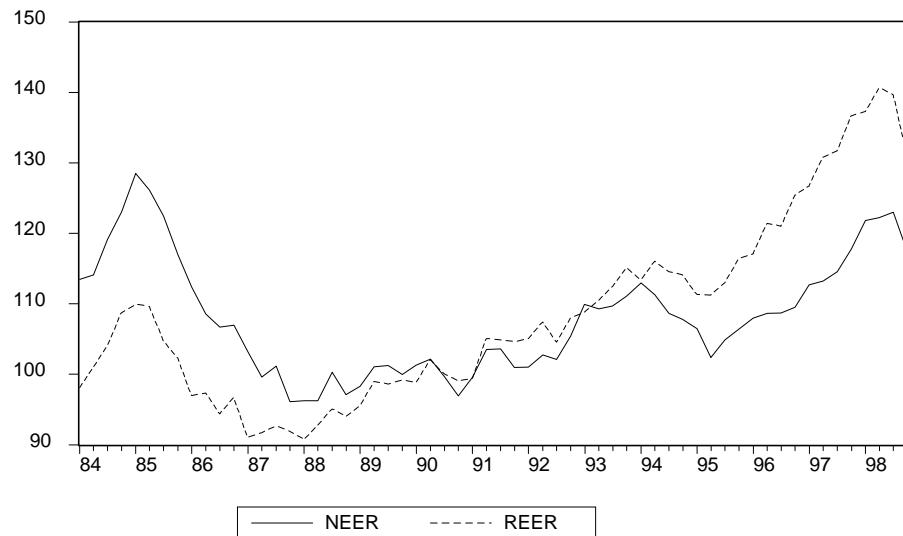
Note: A rise in the index implies an appreciation of the Hong Kong dollar against the country's

major trading partners' currencies.

Source: IMF, *International Financial Statistics* and J.P. Morgan exchange rate index series

**Figure 3b: Singapore dollar's Nominal Effective Exchange Rate (NEER)
And Real Effective Exchange Rate (REER) (1995=100)**
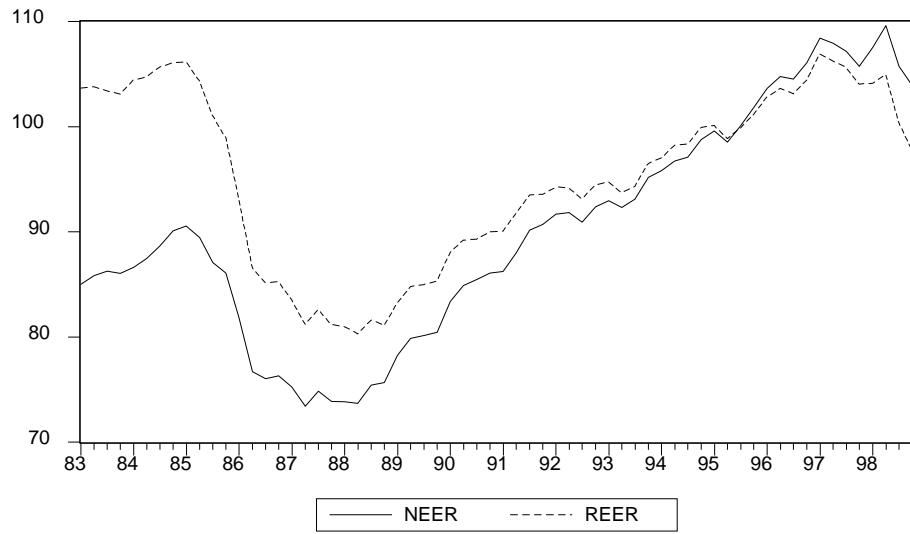
Note: A rise in the index implies an appreciation of the Singapore dollar against the country's

major trading partners' currencies

Source: IMF, *International Financial Statistics* and J.P. Morgan exchange rate index series

**Figure 4a: Hong Kong's Total Exports, Domestic Exports and Re-exports
in HK$ (millions)**

**Figure 4b: Singapore's Total Exports, Domestic Exports and Re-exports
in Singapore $ (millions)**

Figure 5a: Nominal Exchange Rate
**(Pre-Crisis Period: January 1995 - May 1997)**
(US$1 = domestic currency; January 1990 = 100)
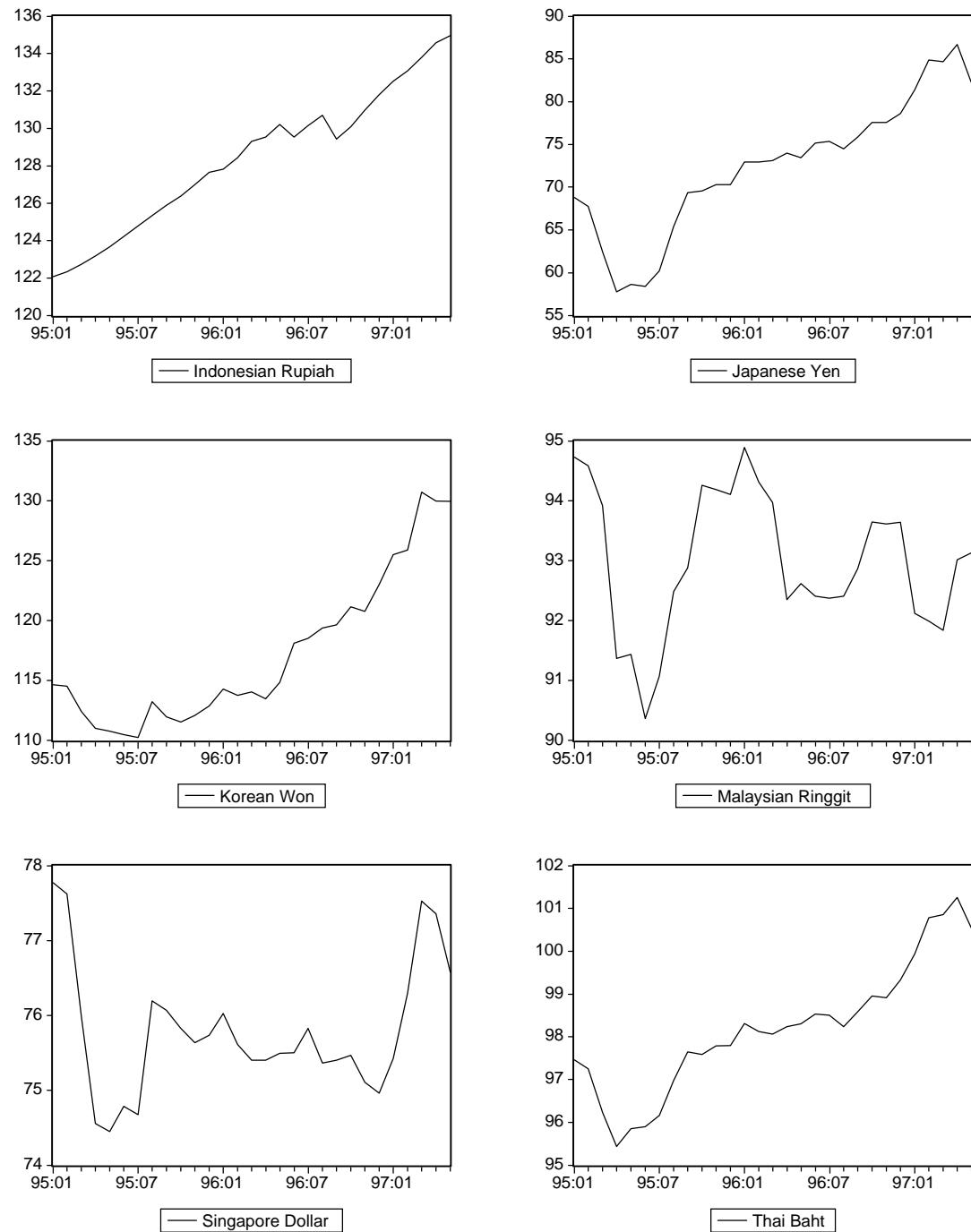

Source: IMF, *International Financial Statistics*

Figure 5b: Nominal Exchange Rate
(Pre-Crisis Period: January 1997 - May 2000)
(US$ 1 = domestic currency; January 1990 = 100)
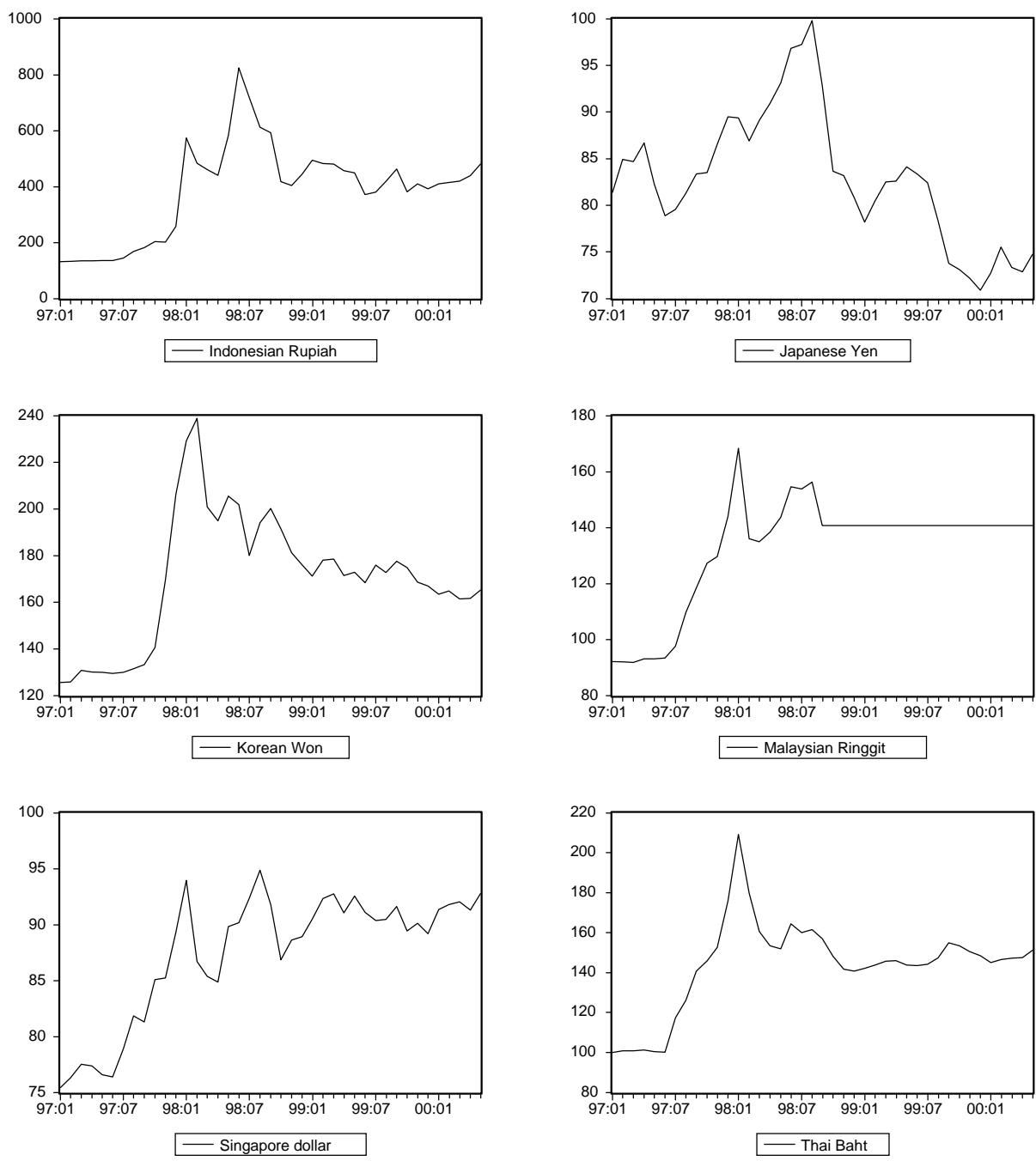
Source: IMF, *International Financial Statistics*

**Figure 6: Three-month Time Deposit Rate**
(in percent)
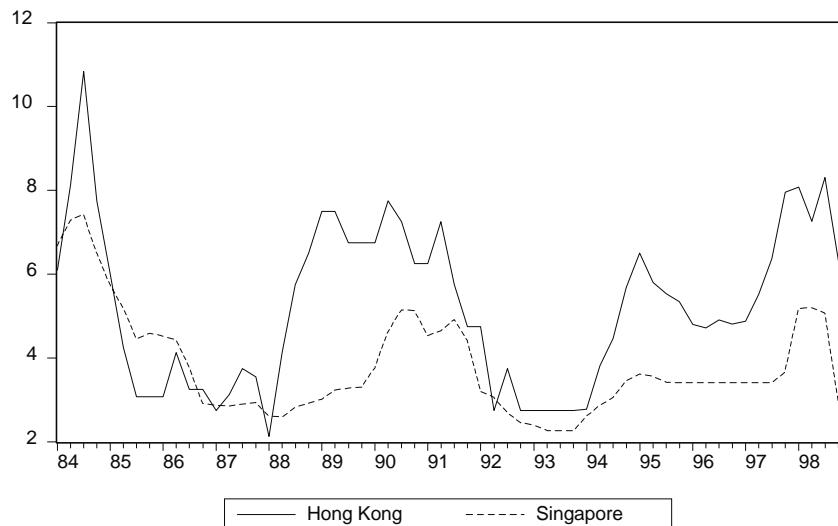
Source: IMF, *International Financial Statistics* and HKMA, *Hong Kong Monthly Digest of Statistics*

Figure 7a: Real GDP Growth Rate (%)
(percent)
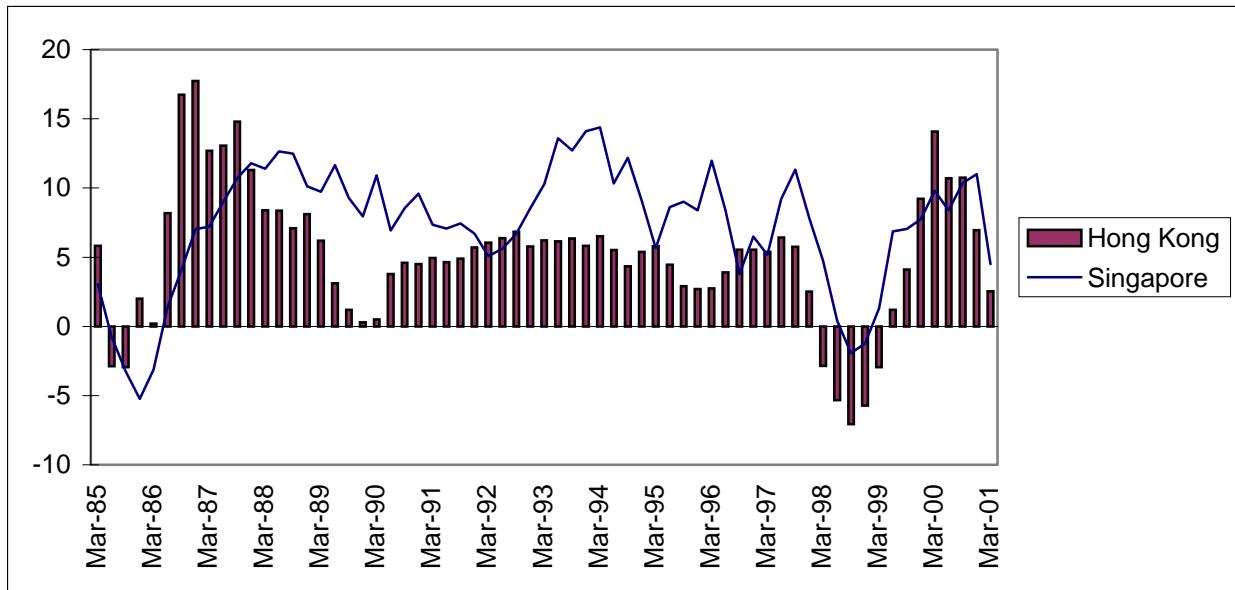
Source: CEIC database

Figure 7b: Real GDP Growth Rate
(percent)
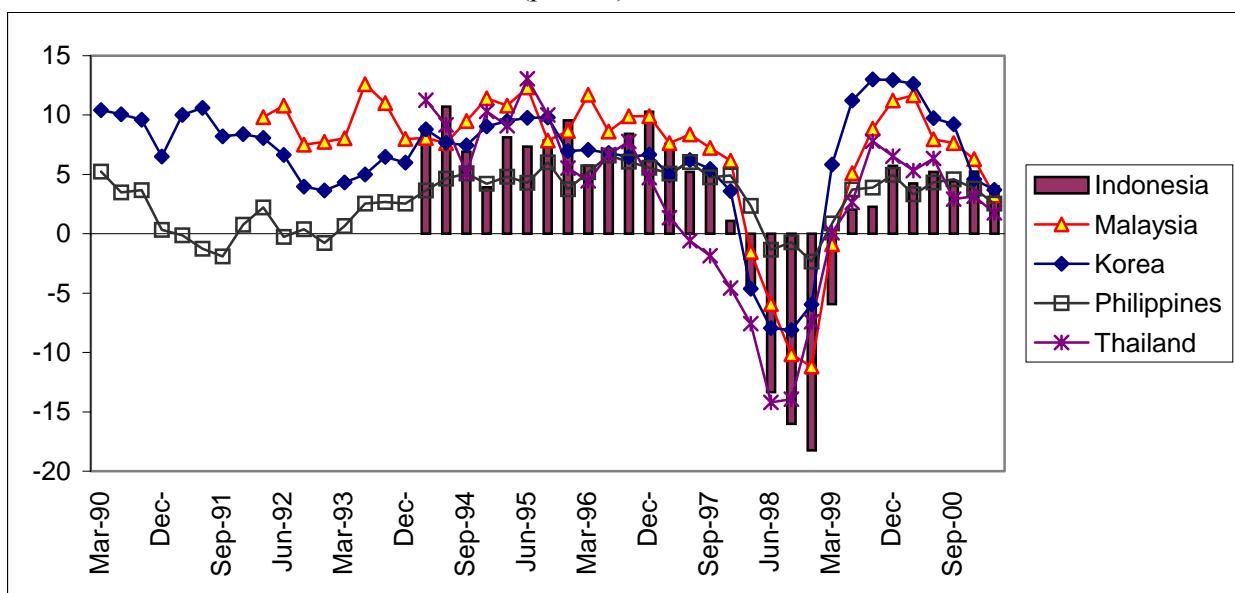
Source: CEIC database

Figure 8

HK: Forward Exchange Rate: 7 Days Premium
Basis Pts
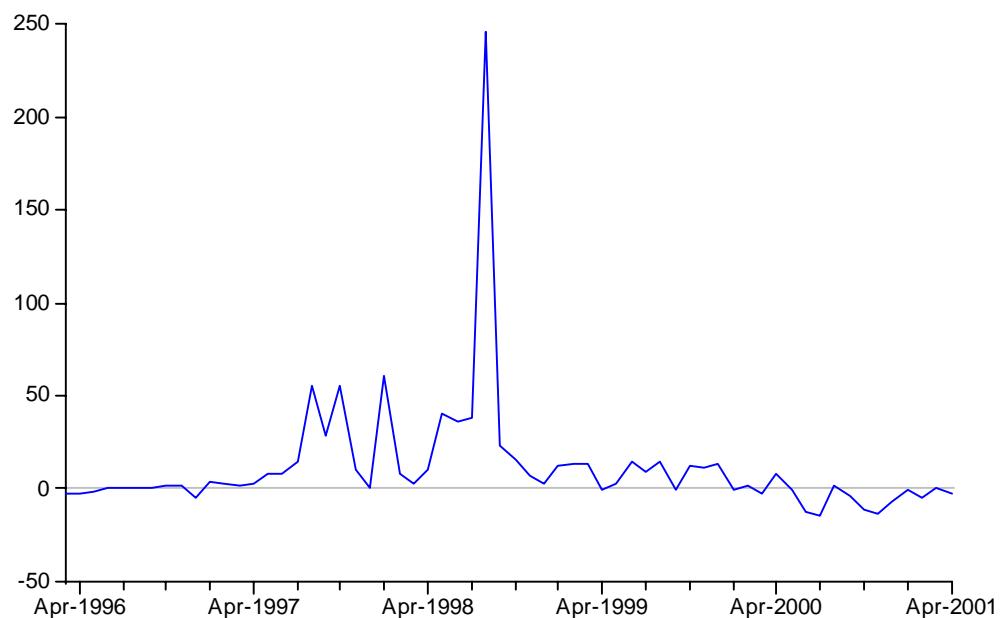
Source: CEIC database

Figure 9

Comparison of Export Growth Rate of Hong Kong with the Asia-5 Economies
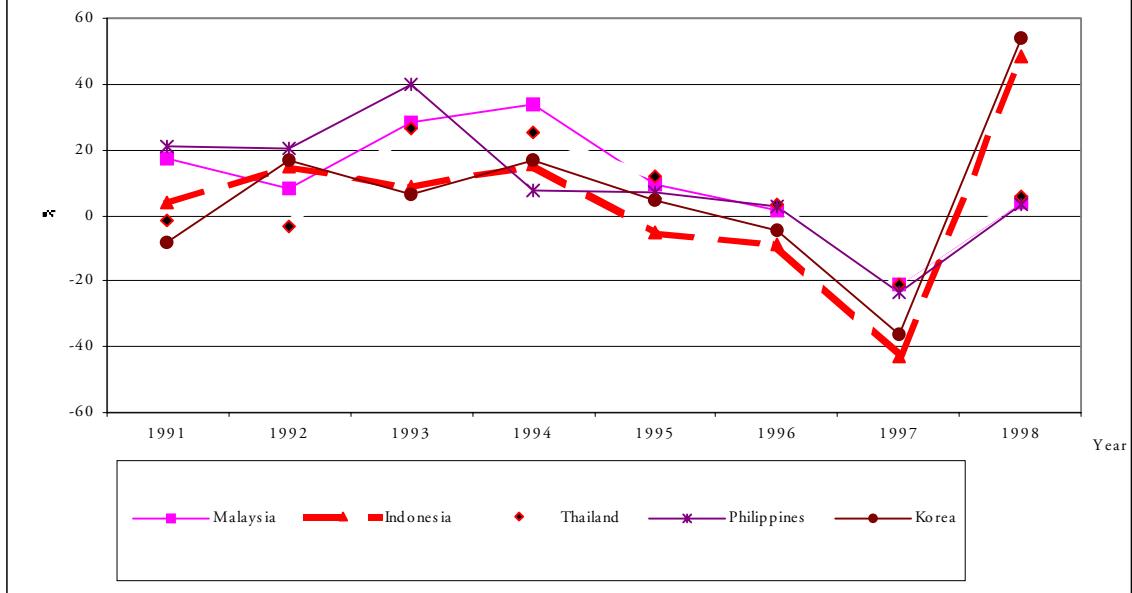
Source: See text

Figure 10

Comparison of Export Growth Rate of Singapore with the Asia-5 Economies

Source: See text