

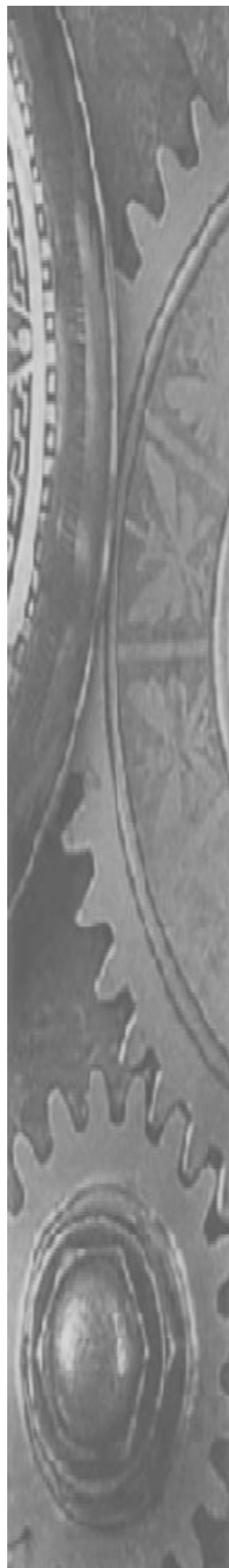
*Economics Department*

# *Quarterly Bulletin*

*Volume II, Issue 4  
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Monetary Authority of Singapore



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# 1 International Environment

## 1.1 External Economic Developments

Global economic conditions have begun to exhibit signs of softening in Q3 2000, after the buoyant growth in 1H 2000. The developed economies, particularly the US, have already begun to slow, and this has started to take its toll on Asia in recent months. Inflationary pressure continued to pick up mildly in Q3 2000 as oil price escalated during the quarter. The less favourable external environment is likely to effect to the Singapore economy in the coming quarters.

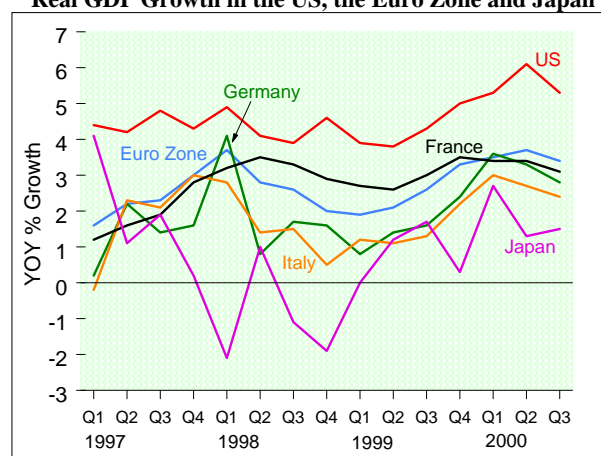
### US, Europe & Japan

Among the G3 economies, the US economy is showing clearer signs of moderation, although it remained uncertain as to whether the economy will enter into a hard or soft landing. Hopes of a sustainable Japanese economic recovery seemed to have faded. Although economic activity in the Euro Zone remained buoyant, it has shown signs of reaching its peak. (Chart 1.1)

Real GDP growth in the US eased to 5.2% in Q3 2000, from 6.1% in Q2 2000, with much of the decline accounted for by the unexpected fall in government spending. Monetary policy tightening by the Federal Reserve since mid-1999 has also begun to take effect. Household spending and residential construction moderated due to higher mortgage rates and stock market declines. Orders for non-military capital goods also fell significantly, indicating softer business investment moving forward.

Real GDP growth in the Euro expanded by 3.4% in Q3 2000, slightly lower than the 3.7% growth in Q2. Growth in Germany, France and Italy tapered off slightly to 2.8%, 3.1% and 2.4%, compared to 3.3%, 3.4% and 2.4% respectively in Q2 2000. Industrial production was growing at a slower pace in recent months. Although surveys of consumer and business confidence indicated that sentiment remained positive, the indices had retreated from highs reached in the middle of the year.

Chart 1.1  
Real GDP Growth in the US, the Euro Zone and Japan



Economic conditions in Japan remained dismal in Q3 2000, with the preliminary estimate of real GDP growing by a marginal 0.2% (QOQ, SAAR), contributed mainly by the sharp contraction in public investment. Private consumption remained depressed while the external sector was affected by the softening global demand. Although changes in Japan's GDP series resulted in an upward revision in growth to 1.8% in the first three quarters, compared to 1.1% under the old methodology, optimism over the recovery is petering out, as reflected in the latest Tankan survey, indicating that business confidence is peaking.

CPI inflation in the US and Euro Zone continued to rise on account of higher oil prices and narrowing output gap. On the other hand, Japan continued to experience falling prices. (Chart 1.2)

In the US, overall inflation has remained above 3% since Feb 2000, while core inflation was above 2.5% in Aug, Sep and Nov 2000. The Federal Reserve's daunting task ahead is to guard against price pressures, while attempting to maintain conditions conducive to a soft landing.

In the Euro Zone, harmonised inflation edged up to 2.8% in Sep, from around 2% in the first five months of the year. This was driven largely by higher energy and processed food prices. Core inflation had also been rising, reflecting buoyant economic activity.

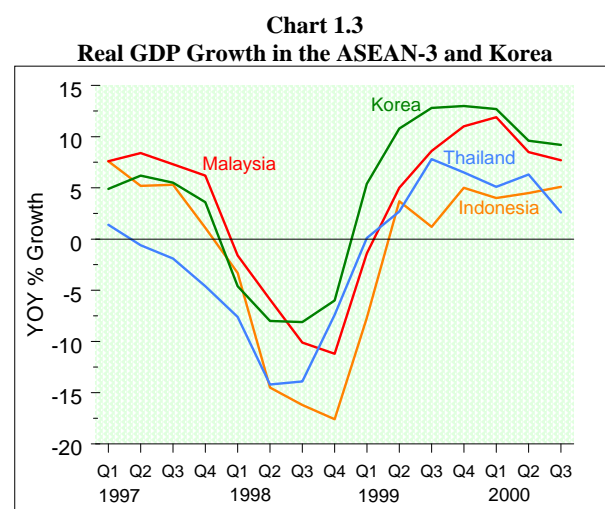
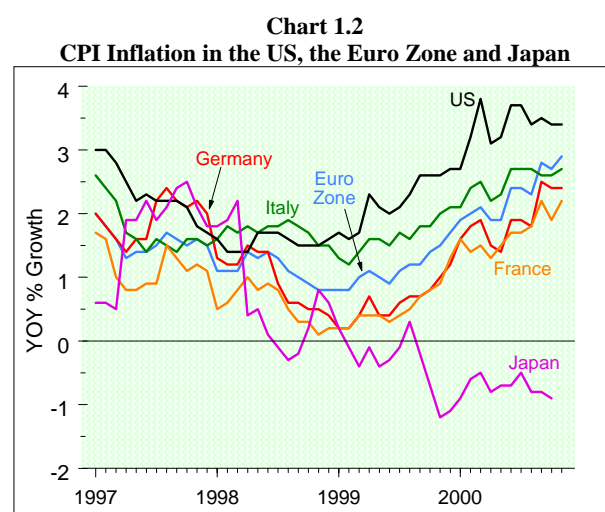
In Japan, consumer prices continued to contract, due to the strong yen and declining prices resulted from ongoing deregulation. In addition, depressed consumer demand had also restrained prices.

## East Asia

Growth of crisis-hit economies (ASEAN-3 + Korea) generally registered slower growth while other Northeast Asia economies continued with their robust expansion in Q3 2000. (Chart 1.3 and Chart 1.4)

In Korea, real GDP growth moderated to 9.2% in Q3 2000, due to slower consumer spending and estimated equipment investment. Although export and import growth remained high, they have decelerated in Q3 2000.

Growth in Malaysia was largely driven by domestic demand (reflecting strong growth in private consumption and gross fixed capital formation), which contributed



15% points to the 7.7% growth in Q3 2000. However, the expansion was dampened by contractions in net exports, which had been negative for two consecutive quarters.

Thailand's real GDP growth slowed to 2.6% in Q3 2000, from 6.3% in the previous quarter. The weaker growth was due largely to sluggish domestic demand. Gross fixed capital formation, in particular, contracted by 2.4% in Q3, reversing the growth of 1.7% in Q2. On the other hand, net exports continued to be strong, contributing 2.4% points to growth. From an output perspective, the fall in GDP growth was largely due to the sharp contractions in the construction and financial intermediation sectors.

Indonesia continued to register broad-based growth of 5.1% in Q3 2000, reflecting strong growth in private consumption, gross fixed capital formation, as well as exports.

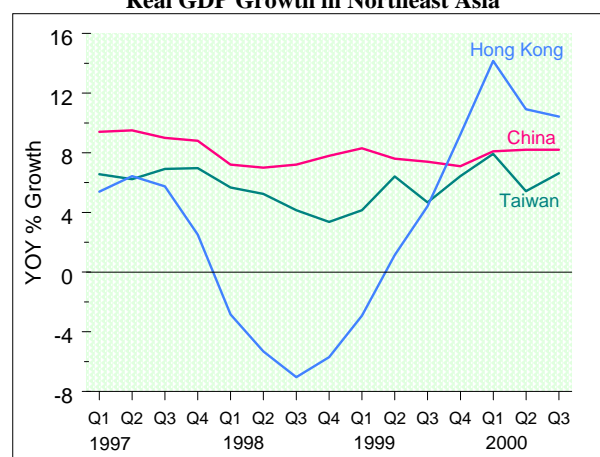
The Chinese economy expanded by 8.2% in Q3 2000, the same rate as in Q2 (Chart 1.4). Growth was supported by continued expansions in consumer spending and fixed asset investment. Although both export and import growth seemed to have moderated from its peak, the economy is on track for 8% growth this year.

The strong growth momentum of the Hong Kong economy in H1 2000 was extended into Q3 2000. Real GDP growth reached 10.4%, after hitting 10.9% in Q2 2000. Growth was broad-based, reflecting robust growth in private consumption, private investment and exports. In particular, private investment contributed a hefty 3.8% points to real GDP growth in Q3 2000, suggesting that the economic recovery is on a firmer footing.

The Taiwanese economy expanded by 6.6% in Q3 2000, stronger than the 5.4% growth recorded in Q2 2000, on the back of healthy export momentum and a surge in investment. However, private consumption, which comprised about 60% of GDP, grew by a smaller 5% in Q3 2000, compared to 5.6% in Q2, as consumers had become more reluctant to spend due to expectations of a slowing economy.

In Korea, inflation had crept up due to higher oil prices and a narrower output gap, prompting the Bank of Korea to raise its overnight call rate. Core CPI inflation exceeded 2% in the four months through Nov 2000, from below 1% in the first two months of 2000. (Chart 1.5) Nevertheless full year inflation is likely to remain within the Bank of Korea's target range of 1.5-3.5%.

**Chart 1.4**  
**Real GDP Growth in Northeast Asia**



In Malaysia, CPI inflation registered an uptick to 1.9% in Oct 2000, from 1.5% in the previous two months, as a result of a sharp increase in transport and communications prices. Nonetheless, inflation in the first ten months of the year averaged a relatively low 1.5%.

In Thailand, CPI inflation remained below 2% in Oct and Nov 2000, as higher costs of transport and communications, health and personal care, and housing and furnishing were offset by contractions in food prices.

Indonesia has experienced broad-based increases in consumer prices this year. CPI inflation accelerated to 9.1% in Nov 2000, from contractions in the beginning of the year. In particular, prices of education and transport rose by above 10% in the last two months.

In Taiwan, consumer price inflation rose from 1.0% in Oct to 2.3% in Nov 2000, the highest in about two years. (Chart 1.6) This was, however, due to a one-off factor, as agricultural output were seriously affected by Typhoon Xangsane in early Nov, which caused food prices to surge by 3.4%.

Deflationary pressure in China seemed to have subsided. Consumer prices fell in only 3 out of 11 months this year, a turnaround compared to last year, when prices fell throughout. CPI inflation rose 1.3% in Nov 2000, from flat growth in the previous two months, contributed by higher food prices, utilities charges and housing rents.

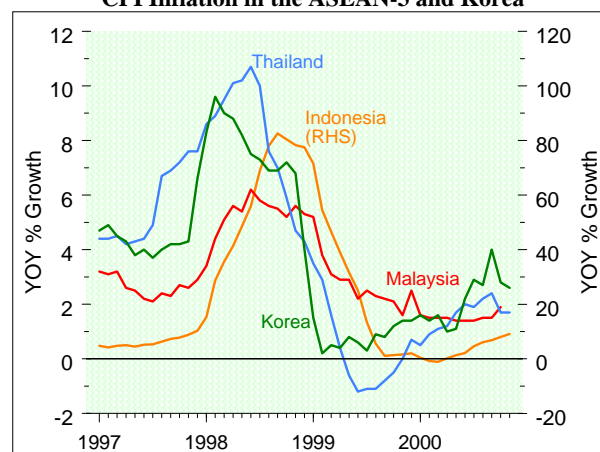
Deflation in Hong Kong continued to ease. The composite CPI inflation fell by a smaller 2.0% in Nov 2000, from 5.3% in Jan 2000. This was largely due to the strong economic recovery. Housing rentals and prices of clothing and footwear remained the biggest drag on the CPI.

## Outlook for 2001

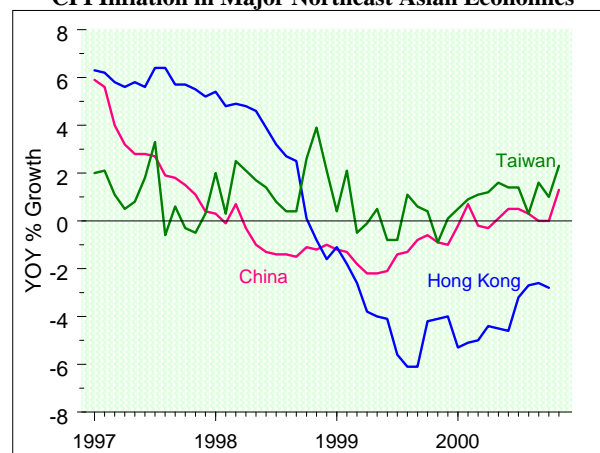
The expected softening of some of the G3 and Asian economies, as well as the impending moderation of the tech sector had cast a pall over the outlook for the rest of the world in 2001.

A sharp correction in asset prices remained as a major risk to the US economy. Despite recent corrections, valuations of US stocks remained high by historical standards. The price-earnings ratio stood at 26 times in

**Chart 1.5**  
CPI Inflation in the ASEAN-3 and Korea



**Chart 1.6**  
CPI Inflation in Major Northeast Asian Economies



Nov 2000, compared to 22 times in Sep 87, just before the stock market crash.

Coupled with uncertainty in the US, the initial optimism over the Japanese economy had waned. Exports are slowing, while private consumption is likely to remain weak. The authorities are targeting growth of 1.7% in the next fiscal year (Apr 2001-Mar 2002), slower than the 1.4% growth this year.

The Euro Zone economy will be an important source of support for global demand in 2001. Growth is expected to slow just a shade compared to the current year, as several economies move deeper into recovery and beyond the peak of their economic cycles.

In East Asia (ex Japan), China is expected to continue to record strong growth with fiscal pump-priming. The Indonesian economy had been resilient to political uncertainty and, having lagged behind in the cycle, may pick up a little momentum. The rest of the region is expected to slow down significantly due to various combinations of weaker external demand, the negative wealth effect on private consumption and moderation in private investment.

The electronics cycle, in particular, will be an important determinant of growth for several East Asian economies next year. Early indications are that the global electronics industry will slow down (although a severe downturn is not expected) in the coming months. Such expectations are currently being built into the prices of technology stocks in the US and other markets. The slowdown in global electronics demand will particularly affect countries with a high share of electronics output such as Korea, Taiwan and Malaysia.

## East Asia's Economic Integration – Is it Deepening?

### Introduction

In this section, we examine the recent trends in East Asia's economic integration. Our analysis of the data shows that trade integration is deepening at a fairly rapid rate, despite the absence of a formal regional free trade arrangement. On the other hand, intra-East Asian investment is, declining, both in absolute terms and as a share of total investment. Investment barriers, rather than trade barriers, are thus the main impediment to greater integration. In terms of fundraising, Asian companies are increasingly looking outside, rather than inside Asia.

### Rising Intra-East Asian Trade

The importance of intra-East Asian trade continues to grow. Intra-East Asian trade was estimated to have risen 160% to about US\$732 billion in 2000, from US\$280 billion in 1990. Its share of total East Asian trade is projected to be 34% in 2000, up from 26% in 1990, and 21% in 1980. (Chart 1.7) This indicates an increasing dependence on Asian markets, and

**Table 1: Intra-Regional Trade in Free Trade Areas and East Asia, 1980-2000**

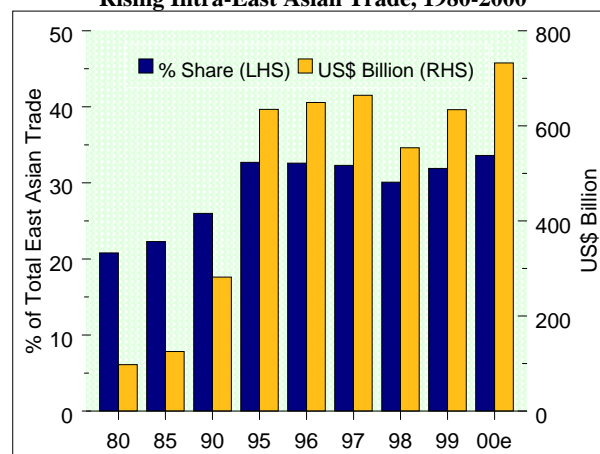
	1980	1985	1990	1995	2000 H1
	<b>% of Region's Total Trade</b>				
NAFTA	19.8	23.4	22.6	26.3	30.7
MERCOSUR	5.3	3.6	5.8	10.6	12.5
EU	40.1	41.2	47.6	44.7	43.7
ASEAN-5	10.7	10.9	9.7	12.0	14.4
East Asia-10	20.8	22.3	26.0	32.7	33.6

Sources: Direction of Trade Statistics, IMF; International Financial Statistics, IMF.

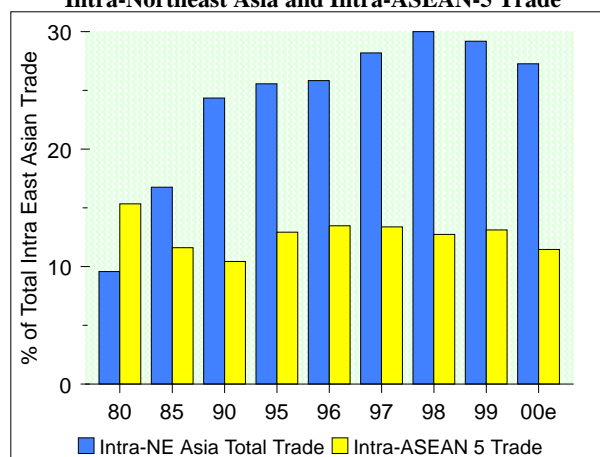
ASEAN-5: Indonesia, Malaysia, Thailand, Philippines & Singapore.

East Asia-10: ASEAN-5, Japan, China, Hong Kong, Taiwan & Korea.

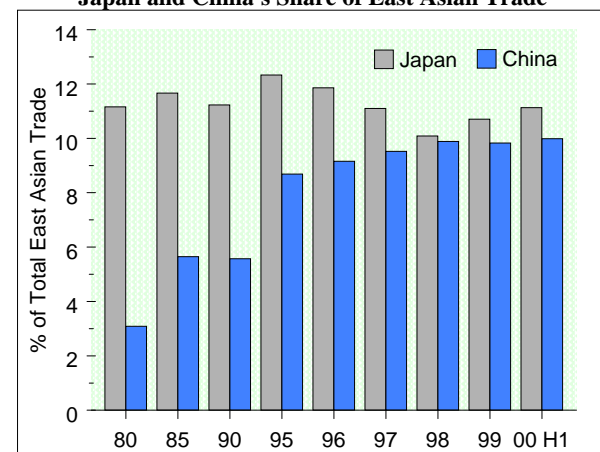
**Chart 1.7**  
Rising Intra-East Asian Trade, 1980-2000



**Chart 1.8**  
Intra-Northeast Asia and Intra-ASEAN-5 Trade



**Chart 1.9**  
Japan and China's Share of East Asian Trade



away from the US and European markets, although the US and Europe remain as important export destinations.

The share of intra-East Asian trade will continue to rise over the medium-term as growth in trade volumes between Asian countries exceed those with the US and Europe. Exports from ASEAN and the NIEs-3 to Japan have expanded 33% since the start of the year. Export growth to China was increasing at just a shade lower. This compares with more moderate export growth rates of about 10-16% to Europe and the US.

Within the larger trend of rising intra-East Asian trade, however, the region of SE Asia has behaved very differently from NE Asia. (Chart 1.8) The significant opening up of China saw intra-NE Asian trade soaring in the 1980s and early 1990s, while the share of intra-SE Asian trade fell. Since then, intra-NE Asia trade share has continued to increase, albeit at a more gradual rate, while the share of intra-SE Asia's trade has stabilized at about 12%.

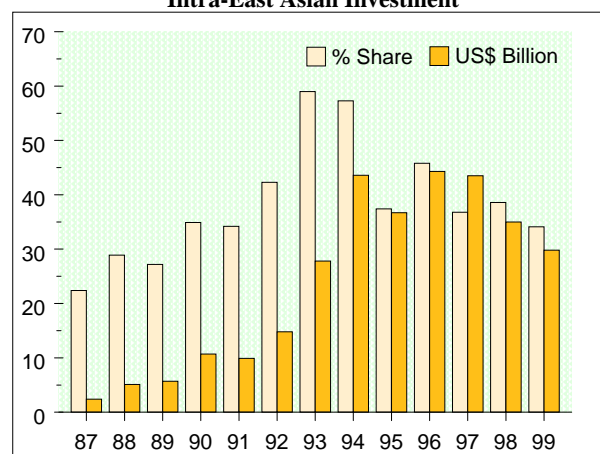
The rise in intra-East Asian trade is powered by China. China's share of East Asian trade increased from 5.6% in 1990 to about 10% by H1 2000. This is only marginally less than Japan's share of East Asian trade of 11.1%, despite Japan's GDP being more than four times China's GDP. (Chart 1.9) Based on our projections of trade volumes, we expect China to overtake Japan in terms of share of East Asian trade in two years or by early 2003. China's WTO accession and liberalization are likely to further accelerate this shift. China is quickly emerging as the largest trading market in Asia, although Japan will remain the largest source of capital in the region.

Nonetheless, the large trade share of China may overstate its importance in terms of final demand compared to Japan. Japan had shifted much of its production abroad and its exports to third countries from these investments are not captured in its trade flows. China, on the other hand, had opened itself to FDIs and most of its trade flows are therefore not a result of domestic demand, but rather a reflection of large intermediate and capital imports and re-exports to third countries. Japan's large outward investment had, therefore, displaced trade volumes while China's large inward investment had increased trade volumes.

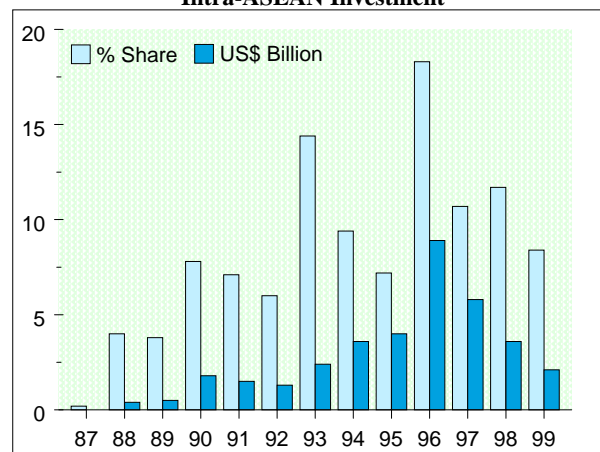
### Falling Intra-East Asian Investment

In contrast to trade, intra-East Asian direct investment has fallen, both in absolute terms and as a share of total

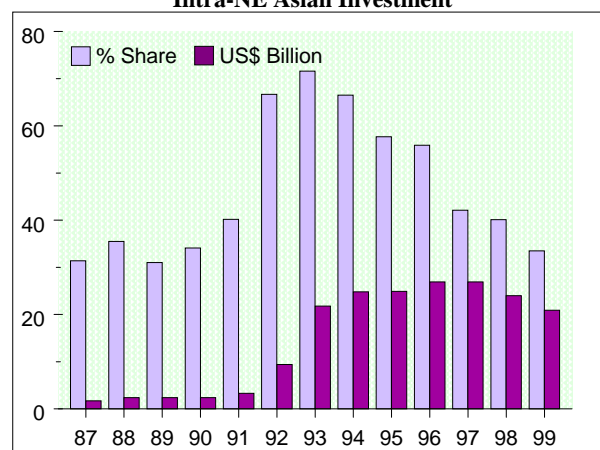
**Chart 1.10**  
Intra-East Asian Investment



**Chart 1.11**  
Intra-ASEAN Investment



**Chart 1.12**  
Intra-NE Asian Investment



foreign direct investment in the region over the last four years.<sup>1</sup> Intra-East Asian investment currently accounts for about a third of total foreign direct investment into East Asia, down from 59% in 1993. (Chart 1.10)

Within East Asia, a number of sub-trends are worth noting. First, both intra-Southeast Asia and intra-Northeast Asia investments had declined. In absolute terms, intra-Southeast Asia investment fell sharply to about US\$2.1 bn in 1999 from US\$8.9 bn in 1996, while intra-Northeast Asia investment dropped, albeit less drastically, from US\$27 bn to US\$21 bn over the same period. (Charts 1.11 and 1.12)

Second, cross-regional investment flows between Southeast and Northeast Asia did not change significantly over the last few years. These cross-flows tend to be dominated by Northeast Asia's investment into Southeast Asia, and Singapore's investment into Northeast Asia, particularly China. (Chart 1.13)

Third, Japan's share of FDI in the ASEAN-5 and NIE-4 had declined. Japan accounted for only about 10.4% of total FDI received in the ASEAN-5 in 1999, compared to a peak of 27.2% in 1990. Similarly, it accounted for just 8.5% of total FDI in the NIE-4 in 1999, compared to a high of 26.7% in 1988. (Charts 1.14 and 1.15)

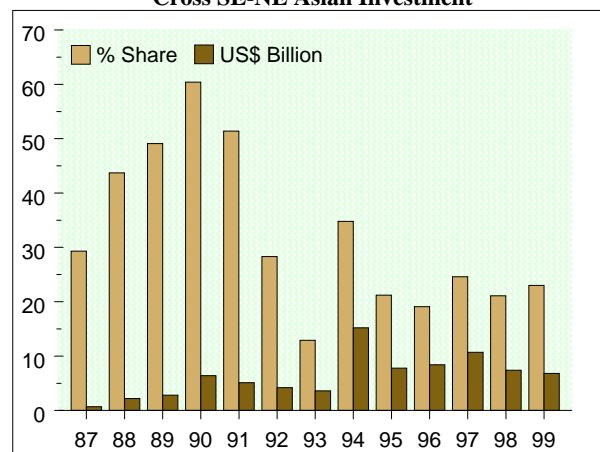
The decline in intra-East Asian investment in absolute terms and as a share of total investment could be attributed to a number of factors.

(a) The dismantling of investment has been slow relative to the elimination of trade barriers. Multilateral trade agreements under the auspices of GATT have succeeded in gradually eliminating trade barriers rather than investment barriers.

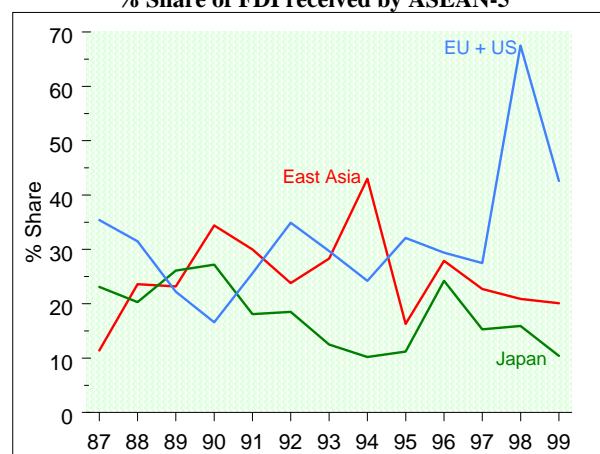
(b) Compared to European or US firms, Asian companies were hurt much more by the financial crisis, and have thus not been able to make long-term investment.

(c) Technological advances in communication had occurred at a more rapid rate than technological advances in transportation. This had reduced the geographical handicap with respect to investment. Capital will thus become less geographic-deterministic over time.

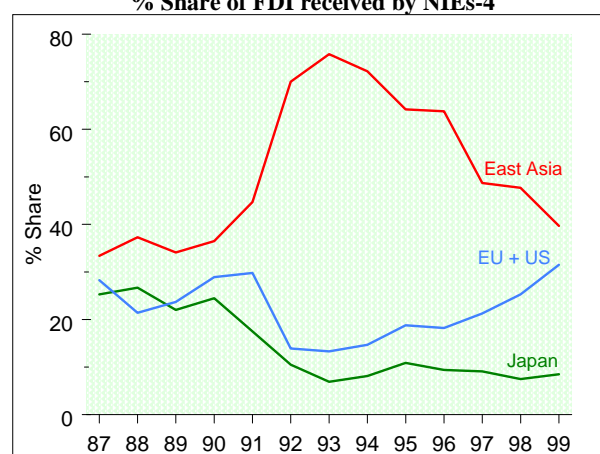
**Chart 1.13**  
Cross SE-NE Asian Investment



**Chart 1.14**  
% Share of FDI received by ASEAN-5



**Chart 1.15**  
% Share of FDI received by NIEs-4



<sup>1</sup> The comparability of the FDI figures across countries is difficult because of varying definitions. The aggregated data should therefore be treated as indicative of trends and orders of magnitude.

## Internationalisation of Fund-raising Operations

The strongest force behind the globalization of emerging equity markets had been the phenomenal growth of the depository receipts (DR) market, predominantly American Depository Receipts (ADRs), Global Depository Receipts (GDRs), and European Depository Receipts (EDRs). Between 1990 and 1999, about US\$133 billion was raised through DR programs. The total market capitalization of all companies with ADR programs at end-1999 exceeded US\$6 trillion, an amount comparable to the total GDP of East Asian economies.

Recent trends suggested that an increasing number of Asian companies are turning to exchanges outside Asia, particularly the US exchanges, to raise capital. Asian companies alone raised about US\$11.5 billion in 1999 or a 38% share of total funds raised from depository receipts. (Chart 1.16) Emerging Asia showed the greatest growth in depository receipts, with the value of funds raised jumping over 800 percent to US\$9.8 billion in 1999 from US\$1 billion in 1998.

The internationalisation of equity markets will see this trend deepen. Many Asian exchanges risk being increasingly marginalised. First, many newly listed emerging market companies are already having their IPOs in mature markets, bypassing local markets completely. Internet companies from Israel, Latin America and Asia, for example, have chosen to list directly on NASDAQ.

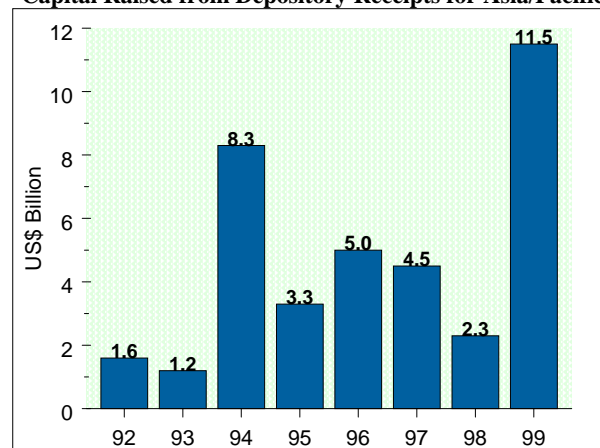
Second, an increasing number of Asian companies have also opted for dual listings, of which the second listing is usually on a US exchange. In many of these instances, the trading volumes in the offshore market are many times larger than those of the home market. Price determination usually occurs outside the country of origin as a result and fund managers naturally gravitate towards these more liquid markets.

Third, when emerging market companies were taken over by mature market companies, they were often removed from the local exchanges.

## Conclusion

East Asia's economic integration is, until now, uneven. Cross-border regional investment and integration of East Asia's capital markets have not kept pace with rising intra-East Asian trade flows. East Asia's economic

Chart 1.16  
Capital Raised from Depository Receipts for Asia/Pacific



integration is therefore best described as narrow, rather than broad. Regional trading arrangements should address the structural decline in intra-East Asian investment flows.

Trade integration continued to deepen at a fairly rapid rate. Neither the financial crisis nor the absence of formal regional free trade arrangements had materially hampered this trend. China is emerging as a large trading powerhouse. China's share of East Asian trade is expected to overtake that of Japan's in the near future. Going forward, improving North-South Korean ties, Taiwan's relaxation of trade and investment restrictions with China, China's and Taiwan's accession to the WTO, AFTA, and a potential Japan-Korea free trade area will drive East Asia's trade integration.

Intra-East Asian investment had fallen both in absolute terms and as a share of total FDI. The sharp improvement in communication technology may partially helped explain why the playing field had moved in favor of investors outside Asia. The financial crisis is likely to be a contributing factor for the recent trends, but this setback may be temporary.

Asian companies rarely relied on other Asian exchanges outside their country of operations to raise capital. Only Hong Kong is emerging as a niche market for China-based companies, accounting for about one-third of the total funds raised. The Singapore Exchange had attracted a few regional companies to list, but the absolute size remained small. Cross-listings and closer alliances between Asian exchanges will continue to be hampered by vastly different regulatory standards, capital controls, and fears of "winner takes all" outcomes. Greater options for raising capital from outside-Asia, either through ADRs or direct listings, dual listings, and rising M&A activity, will increase the competition for Asian bourses.

## 1.2 International Financial Markets

Concerns over the weakness of the Euro, emerging signs of an impending economic slowdown in the US and Europe, as well as pessimism over prospects of tech-related companies were the dominant factors affecting global financial markets in Q3 2000. Although oil prices rose to decade highs towards the end of the quarter and caused some jitters in regional equity markets, markets generally expected the impact on economic growth to be minimal.

### Industrial Countries

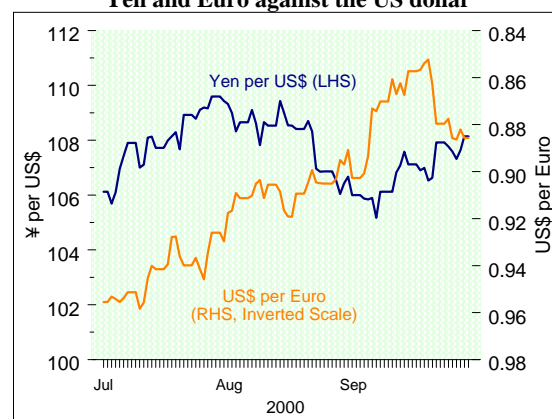
*The Euro reached new lows in September amid bearish Euro-zone growth prospects.*

In currency markets, the Euro fell to new lows against the US\$ in mid-September, but rebounded somewhat after coordinated G7 intervention on 22 September. (Chart 1.17) The declines in the Euro were attributed to heightened inflationary concerns amid oil price increases, increasing M&A outflows, as well as economic data releases in the quarter that suggested some slowing in Euro-zone activities. The Yen was marginally stronger against the Euro but ended the period slightly weaker against the US\$, compared to the levels at end-June 2000. (Chart 1.17) The Yen movements were mostly dominated by the bearish developments in the Euro. However, domestic factors such as the end of the Bank of Japan's zero-interest rate policy and good stock market performance provided some support to the Yen in August.

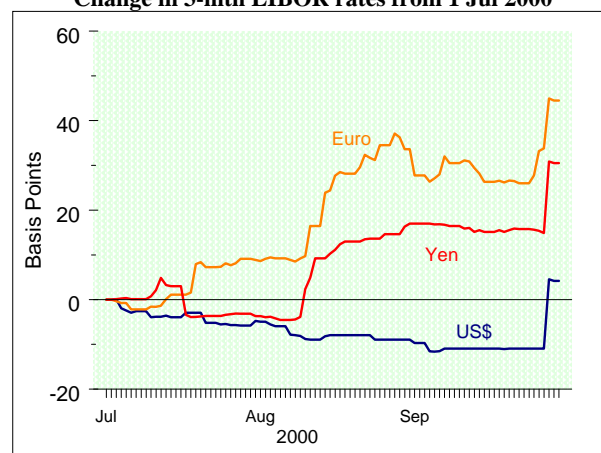
*The US Fed kept rates unchanged. The ECB & BOJ tightened monetary policy.*

The US Federal Reserve left official interest rates unchanged throughout the third quarter, although it still cautioned that the risk of higher inflation remained, given concerns of higher oil prices and tight labour markets. The ECB unexpectedly raised its official rate by 25 basis points on 5 October to 4.75%, motivated by inflation concerns stemming from higher oil prices and the Euro weakness. The Bank of Japan raised its target rate for overnight lending to 0.25 % on 11 August, ending the 17 months of zero-interest rate policy. (Chart 1.18)

**Chart 1.17**  
Yen and Euro against the US dollar



**Chart 1.18**  
Change in 3-mth LIBOR rates from 1 Jul 2000



*Government bond yield movements varied.*

Long-term US government bond yields fell marginally on declining fears of monetary tightening and economic data releases being interpreted by market participants as indicating less inflationary pressure. Despite the stronger-than-expected employment report, treasuries clawed back lost ground towards the end of the first week of October, benefiting from a flight to quality on equity market weakness. Movements in German long-term government bond yields were relatively muted with longer-dated yields rising marginally, reflecting expectations of inflationary pressures going forward. Japanese government short-term bond yields fell while those on longer-dated bonds rose, in response to BOJ's indications that it would not keep long-term interest rates from rising as the economy recovers. This prompted domestic investors to liquidate their positions in the 10 and 20-year JGBs. (Chart 1.19)

*Information and Technology (IFT) stocks were badly hit.*

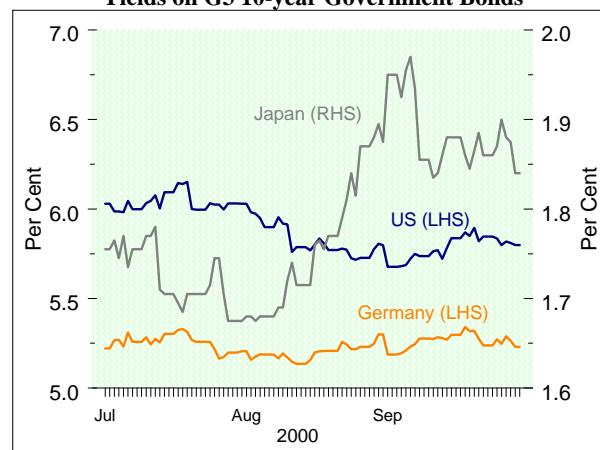
"New economy" stocks were generally more badly affected than other sectors in industrial countries in Q3 2000. The NASDAQ fell 7.4% to 3673 by the end of the third quarter, hit by profit warnings that led to significant concerns on the equity valuations of technology stocks. (Chart 1.20) Non-tech stocks were comparatively strong, with the Dow relatively unaffected, hovering around the 10,500 level throughout the entire quarter. The German and Japanese stock markets fell, the former in response to concerns of higher inflationary pressures in the Eurozone, while Japanese stocks were affected by negative news on Japanese corporates, concerns over the repercussions of Sogo's failure and contagion from the falling US stock market.

## North Asia

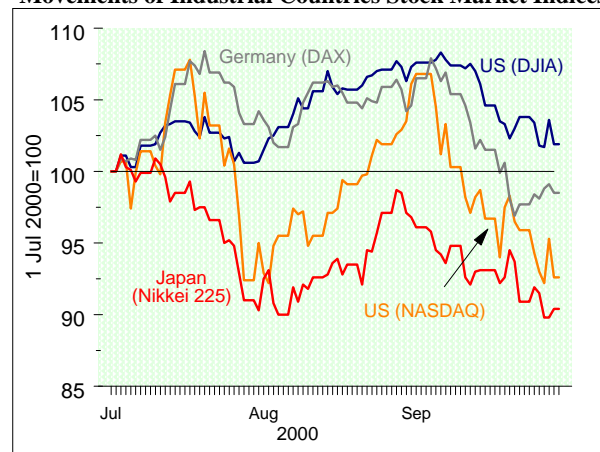
*The Won was unchanged despite end-quarter volatility. The NT\$ weakened on domestic uncertainties.*

The Won was volatile in September, due to an increase in uncertainty over economic prospects and policies pursued by the government, but ended the quarter mostly unchanged against the US\$. Factors contributing to the uncertainty included the government's finalization of its plans to raise another 40 trillion Won (about US\$ 36 billion) through bond issuance to support the financial sector, and the decision by Ford to pull out of its bid for

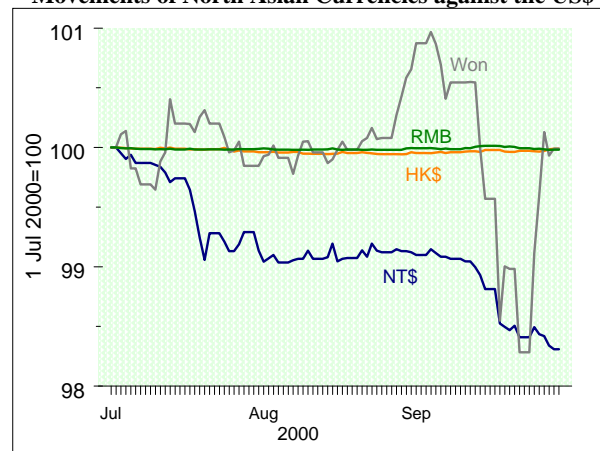
**Chart 1.19**  
**Yields on G3 10-year Government Bonds**



**Chart 1.20**  
**Movements of Industrial Countries Stock Market Indices**



**Chart 1.21**  
**Movements of North Asian Currencies against the US\$**



Daewoo Motors. The NT\$ weakened gradually against the US\$ throughout the quarter. It was unclear, however, to what the degree the weakening was due to the perception of deteriorating economic environment or an increased perception of political risk. The HK\$ finally reached the HK\$7.8/US\$ level at end-Aug, after a steady "500-day crawl" from HK\$7.75/US\$, but has since appreciated slightly. (Chart 1.21)

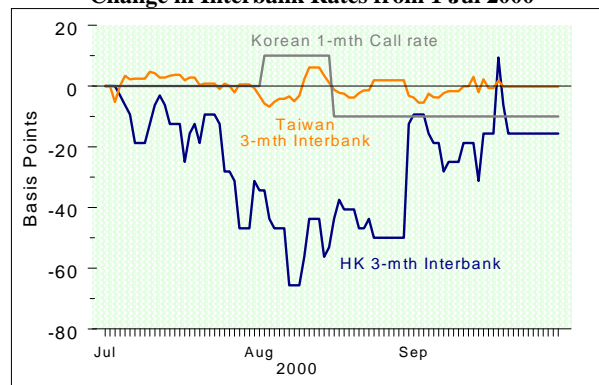
*North Asian rates fell as concerns of further tightening by the US receded. Bond yields were lower and spreads were stable.*

There was little change in short-term rates in North Asia, in line with expectations of less aggressive tightening in industrial countries, particularly the US. (Chart 1.22) Hong Kong interest rates were significantly lower than the US\$ interest rates as this negative spread widened in the quarter. This was widely attributed to expectations of an appreciation of the HK\$ (See above), the abundance of liquidity in the Hong Kong banking system, and the unwinding of short positions against the HK\$ built up earlier. Long-term interest rates in Hong Kong, Korea, and Taiwan also fell in the last quarter, due to prospects of slower economic growth. Except for Korea, North Asian country risk premiums, as indicated by the spreads between North Asian sovereign and quasi-sovereign Eurobonds and US government bonds, were broadly unchanged in the last quarter. The rise in the sovereign risk for Korea was contributed by concerns over the heavy fiscal costs of recapitalising and restructuring the financial sector, as well as resolving the problems created by the failure of Daewoo. (Chart 1.24)

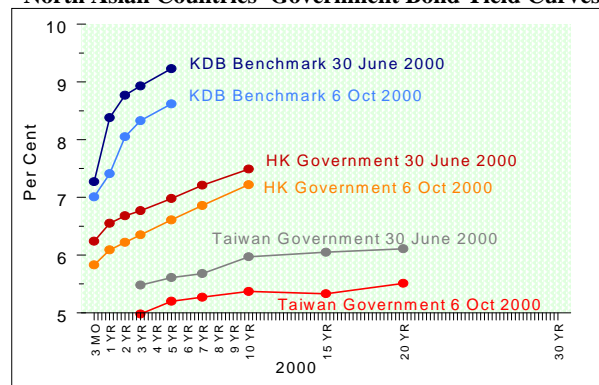
*North Asian stocks fell.*

In line with the poor performance of technology stocks worldwide, the tech-heavy Korean and Taiwanese stock markets recorded contractions of about 25% during the quarter. (Chart 1.25) In addition, the Taiwanese stock market was also affected by the volatile political environment, particularly changes in the Cabinet. However, the decline was cushioned by stock purchases by state funds on a number of occasions during the quarter. The Chinese and Hong Kong stock markets performed relatively better during the quarter. In fact, the Hong Kong Stock Market performed the best among the stock markets in East Asia in Q3 2000, with index rising by 0.2% between 30 June and 6 October.

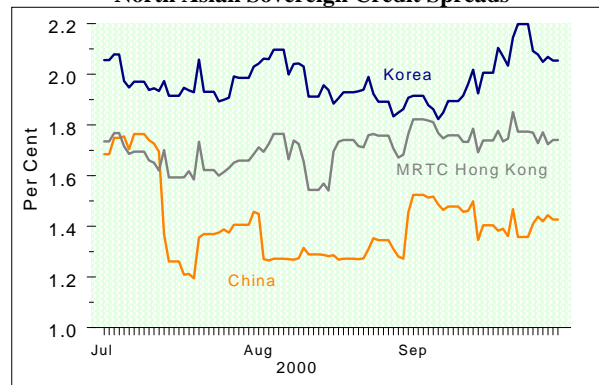
**Chart 1.22**  
Change in Interbank Rates from 1 Jul 2000



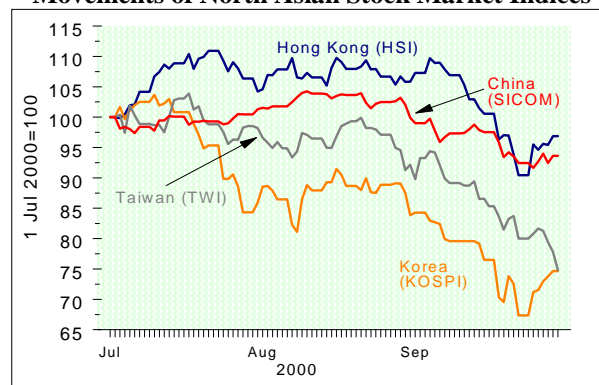
**Chart 1.23**  
North Asian Countries' Government Bond Yield Curves



**Chart 1.24**  
North Asian Sovereign Credit Spreads



**Chart 1.25**  
Movements of North Asian Stock Market Indices



## Southeast Asia

*Regional currencies weaker although Rupiah temporarily rallied in August.*

Major ASEAN currencies continued to weaken against the US\$ during the quarter. (Chart 1.26) Stronger US\$ demand by importers and local corporates, as well as poor regional stock market performance weighed down the Baht and Peso. The Rupiah rallied in August 2000, upon some easing of political tensions and subsequently weakened later in the quarter.

*Short-term rates rose. Spreads were relatively unchanged.*

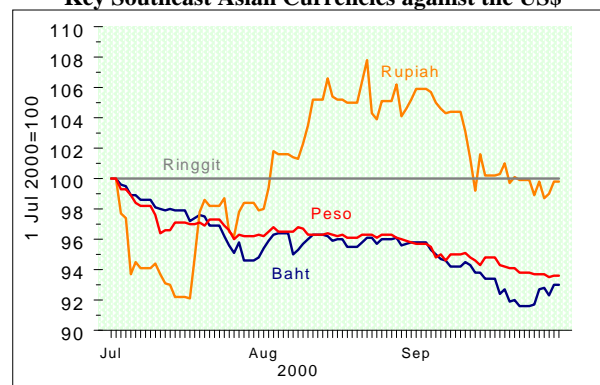
Short-term interest rates in the region generally rose in Q3 2000. In particular, Philippines' short-term interest rates rose sharply after the central bank raised the overnight rate by 1% to support the depreciating peso. Indonesia's short-term interest rates rose probably over liquidity concerns in an uncertain political climate. In contrast, the Malaysian short-term interest rate increased by a slight 14 bps as compared to the 25 bps reduction in the Thai reference rate. (Chart 1.27)

Despite weaker currencies and equities, sovereign risk for ASEAN countries, as measured by the spread between ASEAN sovereign Eurobonds and comparable US Treasuries, was broadly unchanged across the quarter. (Chart 1.28)

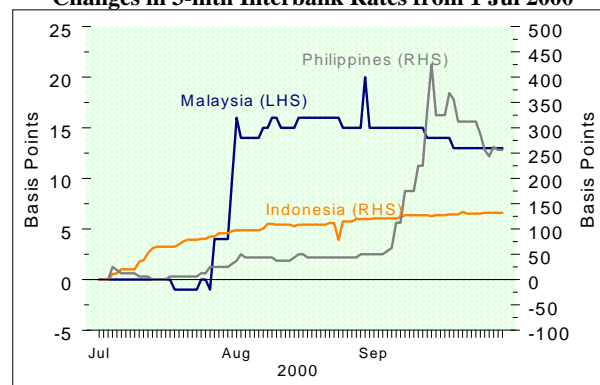
*Stock prices were down on concerns over slower export demand, domestic concerns and reported capital outflows.*

Stock prices in all major ASEAN countries continued in its downward trend in Q3 2000. (Chart 1.29) In general, equity markets were affected by concerns over possible slower growth in exports, as well as capital outflows (or less inflows) stemming from the continued slide in the NASDAQ. In addition, political developments in the region also took its toll on Southeast Asian stock markets. Although the rising oil prices may have caused some initial jitters in regional markets, market participants generally expected the impact on inflation and economic growth would not be significant.

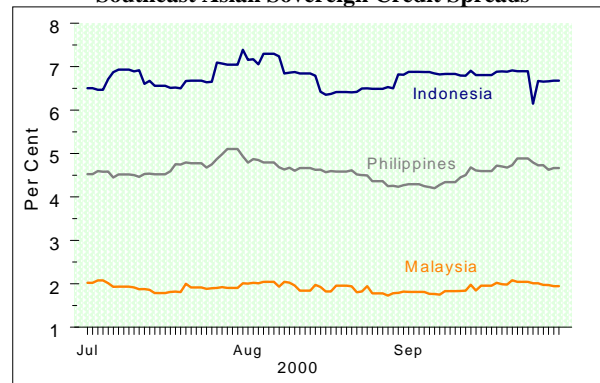
**Chart 1.26**  
**Key Southeast Asian Currencies against the US\$**



**Chart 1.27**  
**Changes in 3-mth Interbank Rates from 1 Jul 2000**



**Chart 1.28**  
**Southeast Asian Sovereign Credit Spreads**



**Chart 1.29**  
**Movements of Southeast Asian Stock Market Indices**



## 2 Demand and Output

Singapore's GDP continued with its robust expansion, recording double-digit growth of 10% in Q3 2000. This brought GDP growth in the first three quarters to 9.8%. The strong growth in Q3 2000 was largely supported by buoyant external demand, which surged by 19%, on the back of healthy global electronics demand and a sustained regional recovery. Consumption continued to increase at a healthy rate, while fixed investment turned in higher growth during the quarter. However, there was some drawdown of inventories after five quarters of accumulation.

In view of stronger-than-expected growth in the first three quarters of 2000, the official forecast was revised upwards to around 9.5%, from the previous 7.5-8.5% range.

Nevertheless, the strong pace of GDP growth in Q3 2000 is not expected to be sustained in the coming quarters, in line with the less rosy outlook for the external environment and expected moderation of global electronics demand. Taking these factors into consideration, GDP is expected to increase by between 5 to 7% in 2001.

**Table 2.1:**  
**Contribution to GDP Growth**

	% point								
	1998	1999					2000		
		Q1	Q2	Q3	Q4	Annual	Q1	Q2	Q3
<b>GDP</b>	<b>0.4</b>	<b>0.8</b>	<b>6.6</b>	<b>6.9</b>	<b>7.1</b>	<b>5.4</b>	<b>10.1</b>	<b>9.0</b>	<b>10.4</b>
Consumption Expenditure	-0.1	2.4	2.5	3.8	2.6	2.8	4.2	4.2	3.7
Public	0.8	2.3	-0.3	-0.1	-0.5	0.3	0.5	0.5	0.2
Private	-0.9	0.0	2.8	3.8	3.1	2.5	3.7	3.7	3.5
Gross Fixed Capital Formation	-2.8	-7.5	-0.9	1.4	1.2	-1.4	1.7	0.1	1.8
Increase in Stocks	-3.9	-2.2	4.0	7.5	7.1	4.1	3.0	1.0	-3.9
Net Exports of Goods & Services	7.1	8.6	1.2	-5.7	-3.4	0.1	1.6	0.0	8.8
Statistical Discrepancy	0.1	-0.5	-0.3	-0.1	-0.4	-0.3	-0.1	0.1	0.0

## 2.1 Aggregate Demand

Aggregate demand recorded its fourth quarter of double-digit expansion of 14% in Q3 2000. (Chart 2.1) This brought total demand for the first three quarters of the year to 13%, comparable to the rates seen in 1993-95. The robust performance reflected continued strength in external demand, while domestic demand growth moderated significantly, dragged down by inventory decumulation.

### External Demand

#### *Goods Exports*

Foreign demand for Singapore's goods surged in Q3 2000, by 22%, a growth rate not seen since 1995. (Chart 2.2) In particular, re-exports accelerated further in Q3, with growth rising to 30% from 25% in H1 2000 and 10% in H2 99, reflecting the strong pace of economic activity in the regional economies. In 1999, demand from the ASEAN-3 (Malaysia, Thailand and Philippines) and NIEs accounted for up to half of Singapore's re-exports.

Domestic exports, which makes up three-fifth of total goods exports, resumed its double-digit growth in Q3 2000 after a temporary moderation in Q2. In Q2 2000, non-oil domestic exports growth [NODX] dipped to 9.2%, following three quarters of double-digit growth, amid concerns of component shortages in electronics. This was largely due to a sharp increase in the growth of NODX, which posted a 17% expansion, as strong global electronics demand continued to boost exports of telecommunication and semiconductor products.

Exports of non-oil, non-electronic, which has seeing volatile growth, posted 10% growth for the second quarter in Q3. In particular, disc media products (packaged software), specialised machinery and ink cartridges continued to see strong external demand although exports of pharmaceuticals remained weak.

Domestic exports of oil saw its first expansion since Q1 99, of 4.9%, contributing to the higher growth of total domestic export demand in Q3 2000. This could be attributed to improved refining margins, on the back of stronger regional demand.

Chart 2.1  
Domestic and External Demand

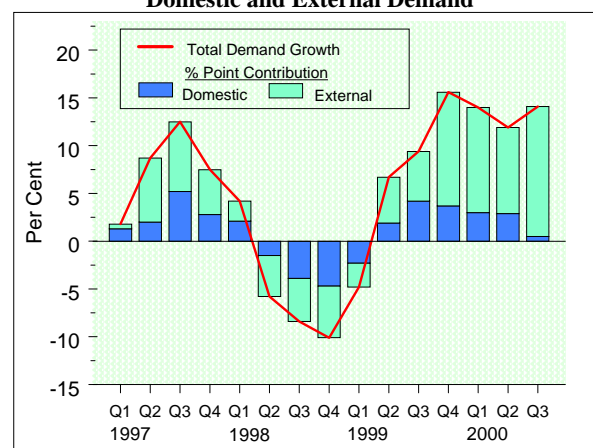
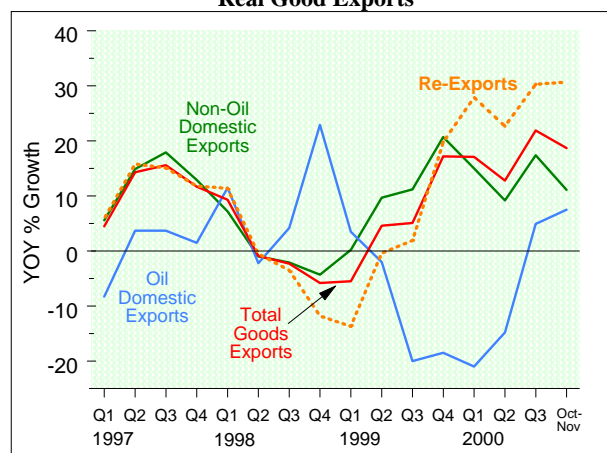


Chart 2.2  
Real Good Exports



NODX to the Asian NIEs continued its growth of over-40% for the fourth straight quarter in Q3 2000 (Chart 2.3). This phenomenal expansion was also seen in the Japanese and Chinese markets. Growth of NODX to the ASEAN-3 remained in the double-digit range, while NODX to the US, our single largest export market, recorded a moderate increase in Q3 2000 after a temporary contraction in the previous quarter. Only NODX to the EU continued to fall, albeit at a less severe rate than the 10% contraction seen in H1 2000.

### Services Exports

Growth in services exports remained under 10% for the second consecutive quarter after growth of 21% in Q1 2000. During Q3 2000, services exports expanded by 5.8%. (Chart 2.4) As in the previous quarter, the moderation in growth of services exports was attributed to a slower increase in the 'Other services' component, which accounts for more than half of total services exports. ('Other services' comprise passenger fares, financial, communication, merchanting, professional and business services.) Growth of travel services receipts also moderated in Q3 2000, to 4.5%, from 8.1% in H1 2000, as visitor arrivals saw a slight slow down in growth. In contrast, exports of transportation services increased further in Q3 2000, by 19%, boosted by healthy receipts from freight services.

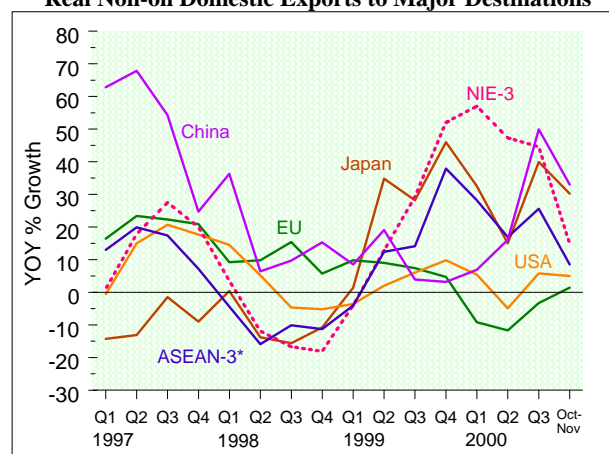
Going forward, growth in both goods and services exports are expected to moderate in 2001, with the impending slowdown of the US and regional economies. This is consistent with the results of the recent Dec 2000 MAS Survey of Professional Forecasters, which show the median forecast for NODX growth for 2001 to increase by 8.4%, from the double-digit growth this year.

### Domestic Demand

Domestic demand rose by a marginal 1.7% in Q3 2000, following four quarters of double-digit growth. The lower growth was attributed to a draw-down on inventories, after five quarters of accumulation. However, excluding inventory, growth of domestic demand would have remained relatively unchanged from Q1 and Q2, at around 6% growth, supported by continued strength in private consumption and investment in machinery and non-residential investment.

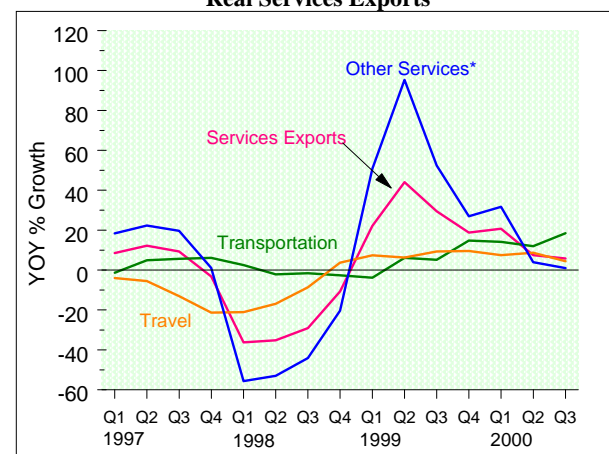
Consumption growth fell slightly in Q3, to 7.5%, from 7.9% in H1 2000 (Chart 2.5), due mainly to a moderation in public consumption growth. Private

**Chart 2.3**  
Real Non-oil Domestic Exports to Major Destinations



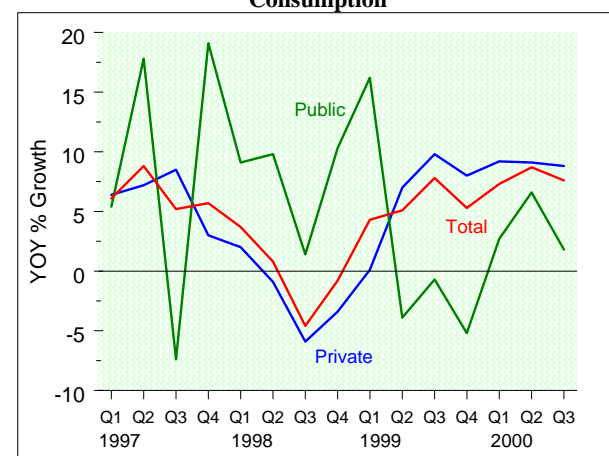
\* ASEAN-3 comprises Malaysia, Thailand and the Philippines

**Chart 2.4**  
Real Services Exports



\* Other services exports include passenger fares, financial, communication, merchanting, professional and business services

**Chart 2.5**  
Consumption



consumption growth on the other hand remained strong, at 8.8%, on the back of positive consumer sentiment and higher disposable income. Private spending continued to be strong in transport & communications, recreation & education and overseas expenditure.

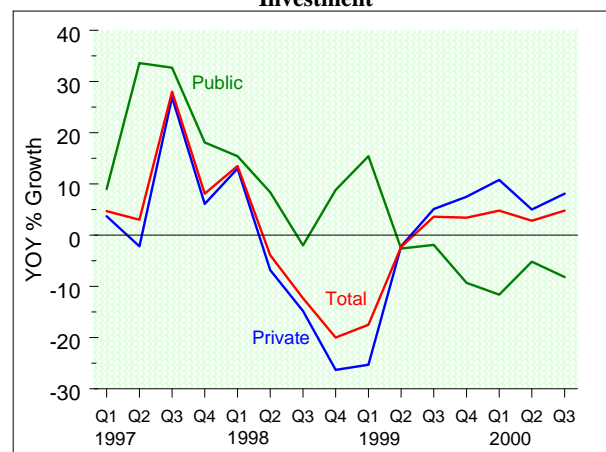
Growth of investment remained fairly healthy in Q3, at 4.8%, compared to 3.8% in H1 2000. (Chart 2.6) The rise in overall investment continued to be supported by private investment, which increased by 8.1%, while the public components declined further.

Stronger private investment growth was mainly on account of higher expenditure in non-residential buildings and machinery equipment. The contraction in transport equipment spending by private firms also moderated significantly. On the other hand, public investment continued to decline as spending on residential and non-residential construction decreased. The former was due to a slowdown in HDB's housing programme, while the latter reflected the completion of projects such as the Tuas incinerator plant and the Bukit Panjang LRT system. Declines in machinery and transport equipment also contributed to the fall in total public investment.

Looking ahead, investment expenditure should see fairly healthy growth in the quarters ahead. In the recent Dun and Bradstreet's quarterly business expectations poll, firms in Singapore were highly upbeat on their business outlook for the final quarter of the year. This was also reflected in EDB's latest Survey of Business Expectations, which found a greater number of firms expecting a positive outlook up till at least the first few months of next year.

Construction investment, which accounts for about half of total investment which has been seeing negative growth, is expected to turn around next year, with the building of the \$1 billion Common Services Tunnel (CST) network at the new Central Business District. With our growing life sciences industry, more investment spending is also expected in this area. Apart from a new life sciences college by the Nanyang Technological University, various private firms are coming to Singapore to build life sciences plants.

**Chart 2.6**  
**Investment**



### Box Item 1: Estimates of Singapore's Long Term Economic Growth

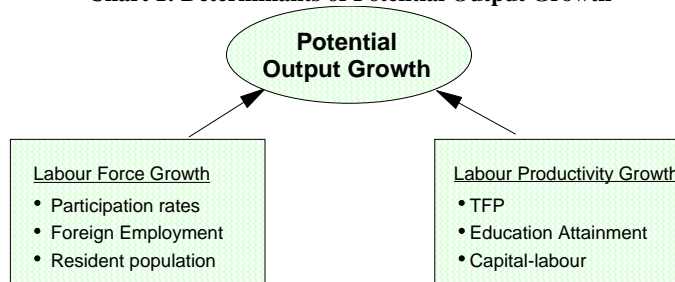
While Singapore's short-term growth prospects will always be subjected to fluctuations in external demand, the economy's long-term growth potential is largely supply-driven, determined by factors such as labour force, labour productivity, and total factor productivity.

MAS recently undertook a study on Singapore's long-term potential growth path. The broad methodology and results are discussed below.

#### Methodology

The methodology used in the projection of potential output growth is summarised in Chart 1 below:

Chart 1: Determinants of Potential Output Growth

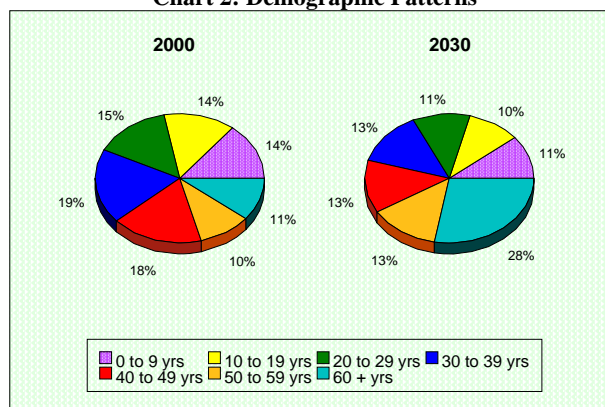


The growth rate of an economy's potential output is determined by the rate of growth of *labour force* and the rate of growth of *labour productivity*. In our projection exercise, *labour force growth* is modelled as a function of participation rates, foreign employment and resident population. *Labour productivity growth* is modelled to be a function of Total Factor Productivity (TFP) growth, changes in capital-labour ratio and educational attainment of the population.

#### Population and Labour Force Growth

We have built a standard demographic projection model which projects resident population dynamically based on current profile of the population and assumptions on future values of fertility, survival and mortality rates. Our estimates show that the growth of the resident population will slow from 1.4% per annum currently, to 0.9% by 2010, 0.7% by 2020 and 0.3% by 2030. A major factor underpinning these projections is a relatively low fertility rate, which though projected to rise slightly over the forecast horizon from the current 1.47, does not reach the replacement rate of about 2.1. Coupled with the post-war 'baby-boomers' leaving the work force from around 2020, working-age population (aged 20-59), currently growing at 2.6%, is projected to be shrinking at over 0.3% from 2020 onwards. Chart 2 captures the changing age profile of the resident population over a 30-year period, and highlights the sharp rise in the proportion of population aged 60 years and over from about 11% currently to 28% by 2030.

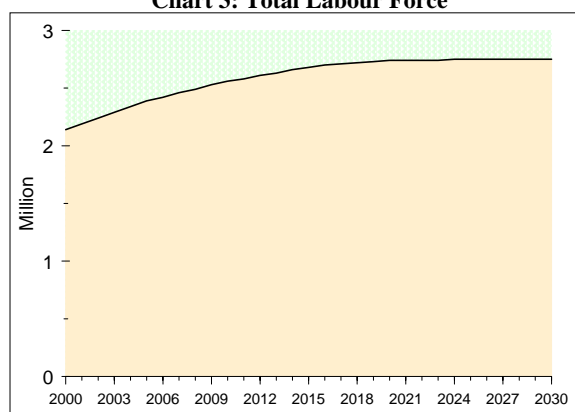
Chart 2: Demographic Patterns



The next step in the forecasting methodology is to apply forecasts of participation rates to the population projections, to obtain the time profile of the labour force till 2030. The participation rates for the main working-age male categories are already quite close to the maximum levels and are projected to plateau-off in the projection period, although there is some scope for participation of the older age-groups, to increase slightly, largely on account of the rise in the retirement age and improved health.

In comparison, age-group specific labour force participation rates for females are likely to continue to experience rising trends. For example, we project the participation rate for females aged 30-34 to rise from 71% currently to 80% by 2010, 85% by 2020 and 89% by 2030. Similar trends, though to varying extents, can be seen in most of the females age-groups, with the shifts in social climate and job nature the reasons behind them. However, at the aggregate level, the participation rate for females is not expected to see much increase because the aging population, - specifically the increasing proportion of the population that move into older age groups with lower participation rates - offsets the increases of participation rates at the age-specific categories. Overall female participation rates are projected to fall marginally from 53% currently to 52% by 2030, while that for males dips from 78% currently to 65% again as a result of aging. Against this backdrop of an expanding but rapidly aging population, we expect the domestic labour force to experience slowing growth going forward, levelling off from 2021. With foreign labour also projected to stabilise from 2021, total labour force growth is expected to remain flat from 2021 onwards.

**Chart 3: Total Labour Force**



### Productivity Growth

In our projection exercise, productivity growth is modelled as a function of changes in education attainment of the population, Total Factor Productivity (TFP) growth and changes in the capital-labour ratio.

Previous empirical studies have established a strong labour augmenting effect from increased educational attainment. Estimates for the US suggest that each year of education brings about a 7% improvement in the quality of labour. We have modelled a similar effect in our projections of labour productivity growth for Singapore, underpinned by an expected increase in the education attainment of the population, which currently at an average of 8.1 years, is projected to continue in its rising trend, to reach developed countries' levels of around 14 years of education.

Next, TFP can be broadly defined as the efficiency with which factors of production are combined to produce output.

Although estimates differ considerably according to methodology and data adjustments, our internal econometric work suggest that TFP growth in Singapore has averaged about 0.9% over the period 1960 – 1986. In our first scenario we have therefore assumed a 1% rate of growth of TFP going forward. However, given the considerable uncertainty involved in estimating TFP and making projections, we have also created an alternative scenario whereby TFP growth rises from 1% in steps of 0.1% per year, and levels off at 2% from 2010 onwards. This slightly more optimistic scenario is premised on the likely positive impact on TFP from significant IT advances in recent years, which can increase productivity by giving a direct boost to TFP. Recent work by Dale Jorgenson (May 2000)<sup>1</sup>, for example, showed that after a 20-year slow-down since the early 1970s, labour productivity in the US accelerated in the 1990s, particularly from 1995 onwards. The improvement in labour productivity can be largely accounted for by faster TFP growth as a result of IT innovations. In addition, the productivity enhancing effects of TFP can be expected to filter through the rest of the economy, when declining IT prices encourage greater investment in IT equipment in these sectors.

Finally, capital-labour ratio is expected to only increase slightly over the projection horizon from current levels.

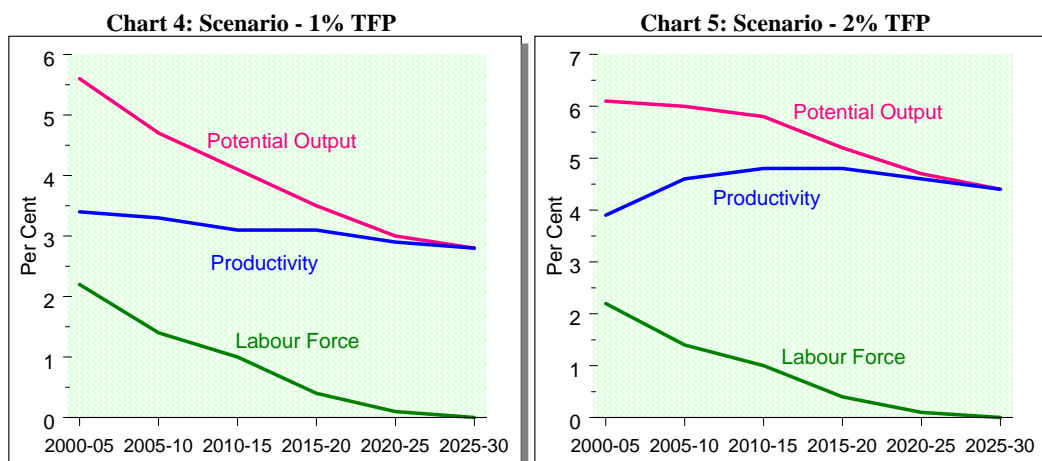
<sup>1</sup> *Raising the Speed Limit: US Economic Growth in the Information Age* by Dale W. Jorgenson and Kevin J. Stiroh, May 2000.

**Results**

Our estimates indicate that Singapore’s long-term potential output growth will slow down from an average of 5.6% in the next five years to 4.1% from 2010 to 2015, and to 2.8% from 2025 to 2030 under the TFP growth scenario of 1%. While labour force growth currently accounts for about half of the growth in potential output, its share will decline significantly over the projection period, falling to zero after 2021. Potential output growth thereafter will be largely accounted for by labour productivity growth, underpinned by assumptions on TFP improvements, and buttressed by smaller contributions from increases in education attainment and the capital-labour ratio.

Under the alternative scenario in which TFP rises to 2% by 2010, potential output growth rate is boosted by about 1.6% points compared to the previous results. Potential output growth for the next five years is expected to average 6.1% each year, slowing to 5.8% from 2010 to 2015 and 4.4% over 2025-2030.

The five-year average growth rates of potential output, labour force and labour productivity are summarised in the charts below.



**Conclusion**

As Singapore’s society matures, the contribution of labour force growth to GDP will taper off. Going forward, Singapore will instead be increasingly looking to TFP growth, through technological or managerial improvements, to drive labour productivity growth and in turn potential output growth. Our projection of slower GDP growth of about 2.8% to 4.4% in the long run is also consistent with trends witnessed in the major developed countries.

## 2.2 Domestic Output

Continued robust growth was evident in most sectors of the economy in Q3 2000. The rapid pace of expansion was sustained by strong growth in both the manufacturing and services sectors. The construction sector, however, continued to contract slightly. (Chart 2.7)

### Manufacturing

The manufacturing sector continued to expand strongly in Q3 and Oct-Nov 2000, buoyed by an increase in production in the electronics segment. (Chart 2.8) Output of electronics turned in double-digit rates of Q3 2000 and Oct-Nov 2000 respectively, on the back of strong global demand for electronic products. In particular, production of semiconductors continued to register double-digit rates, despite plunging semiconductor prices in Oct-Nov 2000.

The performance of the non-electronics industry was weak in Q3 2000 (1.5% growth), but started to improve in Oct-Nov 2000. Output of pharmaceuticals was volatile. (Chart 2.9) It contracted by 18% in Nov 2000, after the rebound in Oct 2000. The transport equipment industry showed some signs of recovery as it recorded a less severe decline of 0.7% in Q3 2000, compared to the 7% decline in the previous quarter. (Chart 2.10) It subsequently registered double-digit growth in Oct-Nov 2000. The improved performance was largely contributed by the marine segment as more contracts were awarded to shipyards in Singapore.

Growth of the petroleum refining industry was back to positive territory in Q3 2000 and Oct-Nov 2000, after eight quarters of contractions. The recovery was underpinned by widened refining margins in Q3 2000 as stronger regional demand allowed refiners to pass on the hike in oil price to consumers, as well as to refinery problems in Indonesia.

Looking ahead, some slowdown in electronics output is expected in the coming months. The electronics industry's Purchaser Managers Index fell 2.4 points to a reading of 53.7 in Nov 2000, signalling a possible slowdown from the rapid expansion of the industry in the preceding months. (Chart 2.11) Prices of semiconductors have come under downward pressure on the back of inventory build-up in the industry. However, the downturn in 2001 is not expected to be as severe as previous episodes in 1998 and 1996. There are several

Chart 2.7  
GDP Growth by Major Sectors

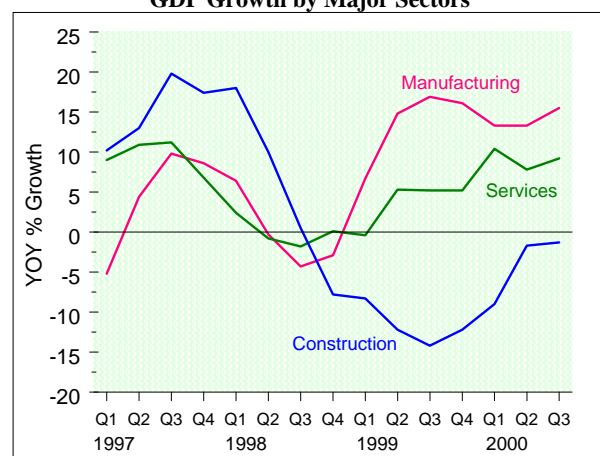


Chart 2.8  
Industrial Production

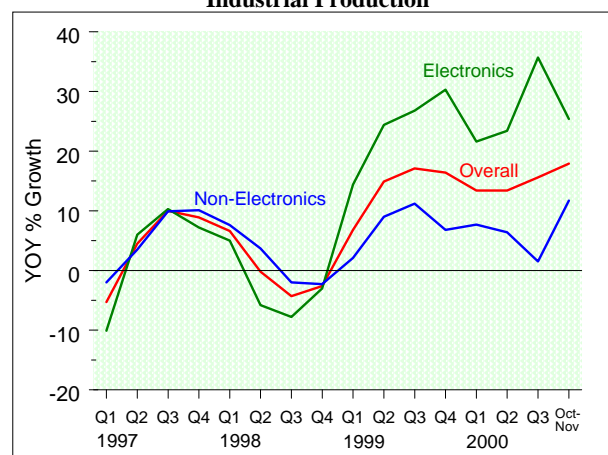
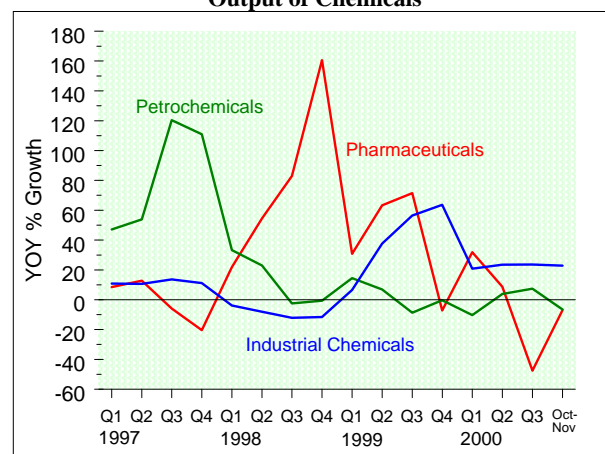


Chart 2.9  
Output of Chemicals



reasons for this. The industry is now more responsive to changes in demand. There are already indications that semiconductor manufacturers are slowing down their expansion plans next year, which will augur well for the recovery of the depressed chip prices. Also, as there was only about one year of above trend-line capital spending growth, the oversupply situation should not be as severe as in 1998. Technology investments have continued, as evident in the continued growth in US private investment in IT, amidst a cooling US economy in Q3 2000. Overall demand in 2001 will also be supported by end-markets such as Internet infrastructure, wireless communications, and digital consumer applications. Despite this uncertainty we expect Chartered Semiconductors and ST Microelectronics to proceed with their plans to roll-out their new wafer fabrication plants in Singapore. This will add some support to production next year. Nevertheless, the risk of a severe downturn, albeit unlikely, still remains if semiconductor prices continue to be depressed. (Please refer to Section 8 on the macroeconomic impact of a global electronics slowdown).

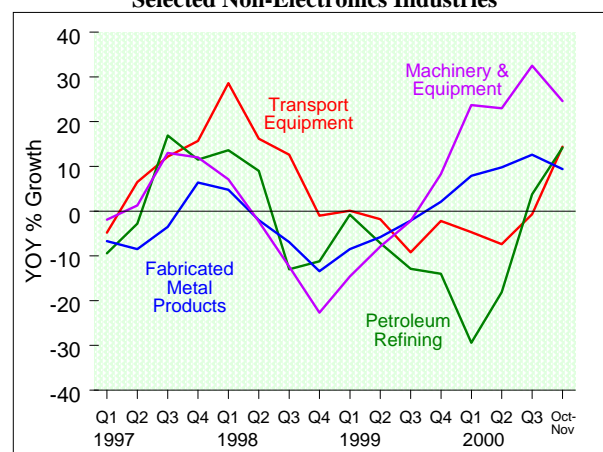
The non-electronics segment is likely to take up some of the slack in the softening electronics sector, with several major projects slated for commercial production in 2001. In particular, the petrochemical industry will receive a massive boost as Exxon's new ethylene cracker and its related downstream plants come on stream in Q1 2001. Also, the two up-coming pharmaceutical plants by Merck, Sharp and Dohme, as well as Wyeth Ayerst are expected to bring the sector back to support output and exports in the sector next year. At the same time, the marine industry is expected to continue to pick-up, on the back of further increases in shipbuilding contracts to our local shipyards.

## Financial Services

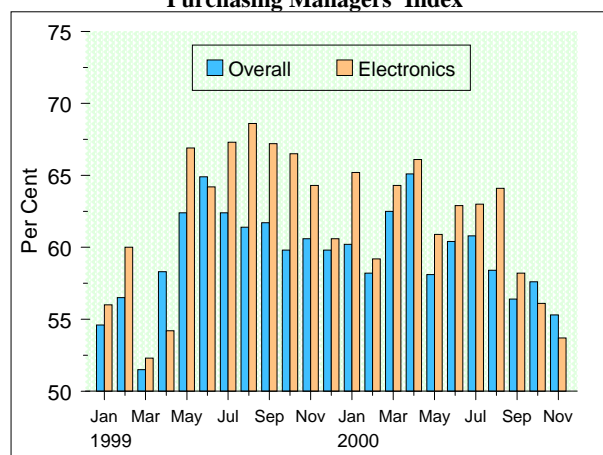
The financial services sector rebounded from a minor contraction in Q2 to grow by 4.0% in Q3. (Chart 2.12) This brought growth in the first three quarters of the year to 4.9%. The return to positive growth in Q3 mainly reflected a significantly smaller contraction in stock market activity, as well as stronger earnings from commercial banks' operations.

The volume and value of shares traded during Q3 shrank by 34% and 26% respectively, compared to a contraction of 71% and 49% respectively in Q2.<sup>2</sup> Compared to the

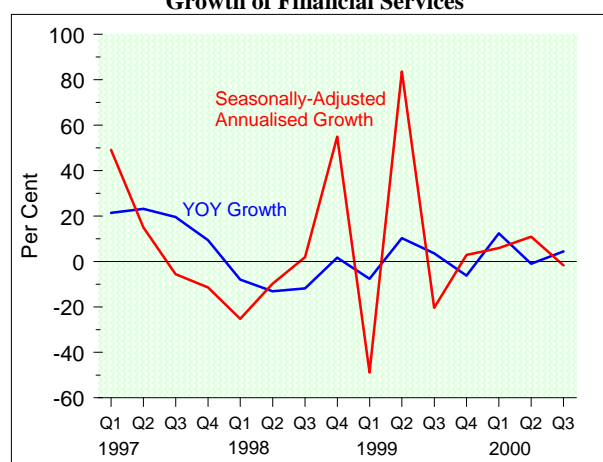
**Chart 2.10**  
Selected Non-Electronics Industries



**Chart 2.11**  
Purchasing Managers' Index



**Chart 2.12**  
Growth of Financial Services



<sup>2</sup> The large decline in Q2 mainly reflected the effect of a high base during the boom period in Q2 1999. Stock market activity could also have been dampened by the minimum brokerage fee of \$30 and the shortened trade settlement period of three days.

previous quarter, however, the number of shares traded rose by 12%, although its value fell by 9%. (Chart 2.13) (Further details on the activity in the stock market during the quarter is provided in Section 3.3.)

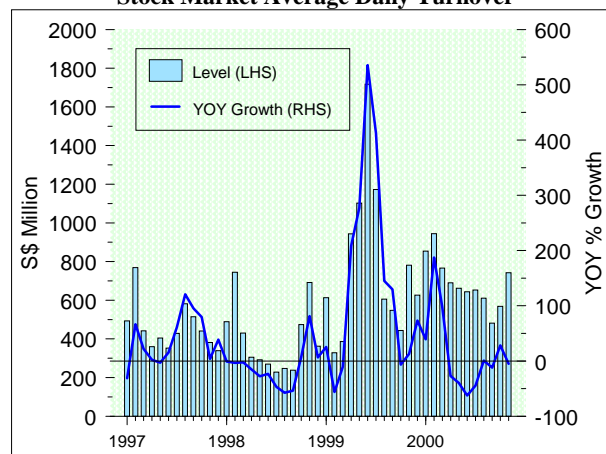
Derivatives trading on the Singapore Exchange Derivatives Trading (SGX-DT) fell by 5.3% in Q3, following two consecutive quarters of positive growth. This was due to fewer options and futures traded, with the former declining sharply by 60%. At the same time, activity in the foreign exchange market remained sluggish, as average daily turnover continued to decline, reflecting the consolidation of treasury operations.<sup>3</sup>

Also performing poorly in Q3 was the offshore Asian Dollar Market, which was dragged down by an 18% decline in loans and advances to non-bank customers. This more than offset the small increase (0.4%) in interbank lending. In Oct 00, both non-bank and interbank lending fell, with lending to non-bank customers falling to US\$91.8 billion – its lowest level in 10 years – on the back of continued decline loans to the regional economies. (Chart 2.14)

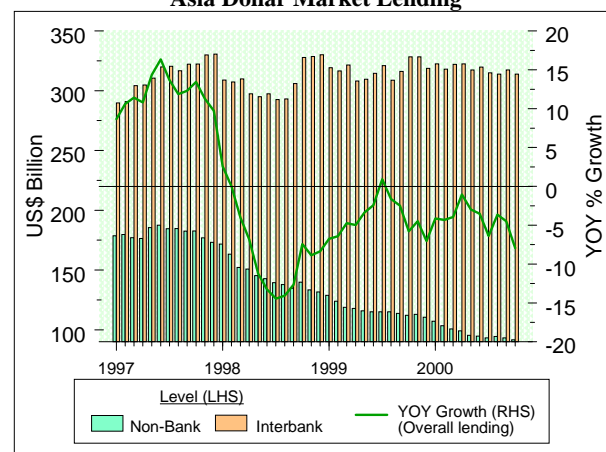
In contrast, domestic commercial banking activity continued to improve, underpinned by stronger growth in loans to non-bank customers as well as fee-based activities<sup>4</sup>. Loan growth rose steadily to 3.4% in Q3 from 0.9% in Q2, supported by an increase in loans extended to housing, construction, manufacturing, professional and private individuals and non-bank financial institutions. Similarly, finance companies performed better, reflecting a sharp rise in hire-purchase financing of motor-vehicles in Q3. Motor vehicle loans rose to a record high of \$5.1 billion in September as lower COE prices and improved consumer sentiment boosted demand for motor-vehicles. (Chart 2.15)

Both the investment advisory and insurance businesses continued to record strong growth in Q3. According to Standard & Poor's Fund Services data, assets under management in Singapore-registered funds expanded by 4% or \$400 million in Q3 to just under \$8.9 billion, as at end of Q3 2000. In line with the strengthening economy, gross premiums collected for general insurance rose by 23%. At the same time, the number of life insurance policies sold and the premiums collected surged by 78% and 33% respectively, due to improved

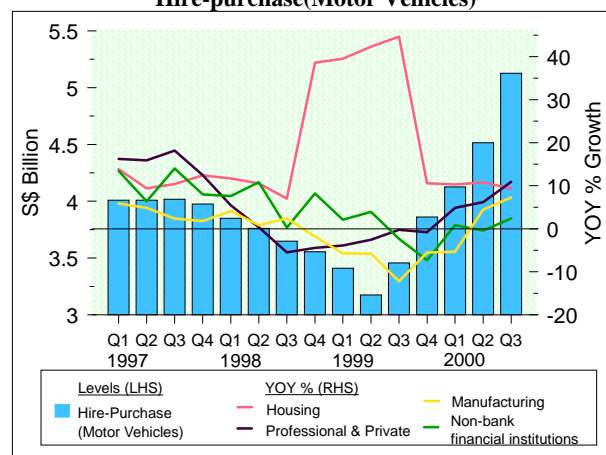
**Chart 2.13**  
**Stock Market Average Daily Turnover**



**Chart 2.14**  
**Asia Dollar Market Lending**



**Chart 2.15**  
**Bank Loans (Selected Sectors) and Finance Companies - Hire-purchase (Motor Vehicles)**



3 ABN Amro Holdings NV has transferred its G-7 forex trading to Sydney while Bank of America, Citigroup and DBS have focussed their regional forex trading hub in Singapore.

4 There has been an increase in equity and debt market issuance in 2000. As at end of Nov, 77 initial public offerings were launched compared to 51 in the whole of 1999. The value of S\$ bonds launched in the same period also almost doubled from the whole of 1999, largely on account of increased issuance from local corporations and statutory boards.

sales from both regular and single premium businesses. (Chart 2.16) About half of the single premium sales for the first nine months of the year came from investment-linked products compared to about 26% for the same period last year. The liberalisation of the CPF Investment Scheme in Jan 2001 - which could potentially release some S\$64 billion<sup>5</sup> of savings - would provide a boost to the fund management and insurance industries<sup>6</sup>. Banks are also coming up with new CPF-approved unit trusts (many offering minimum guaranteed capital returns) to attract investors, which would further bolster their investment advisers' commissions.

### Business Services

The business services sector grew by 7.7% in Q3, the strongest growth since 98 Q2. Both the real estate services and other business services industries recorded stronger growth.<sup>7</sup> The impetus for the growth of real estate services came largely from the pick up in office demand, which saw rentals of office space rising by 11%, while rentals of private properties continued to decline. (Chart 2.17) Liberalisation of the telecommunications industry, coupled with the pick-up in economic activities, continued to fuel the expansion of professional services.

However, compared to the previous quarter, more firms reported lower earnings. According to the Business Expectations Survey (BES) by Department of Statistics, a net balance<sup>8</sup> of 1% of firms in other business services and 27% of real estate firms recorded weaker sales. The former include firms involved in accounting & auditing, management consultancy and advertising services while the latter were largely real estate agents and property developers. The survey also showed that although business expectations for the next six months (Oct 00 - Mar 01) remained positive, the net balance of firms which expect stronger earnings declined for the second consecutive quarter. (Chart 2.18) In other business

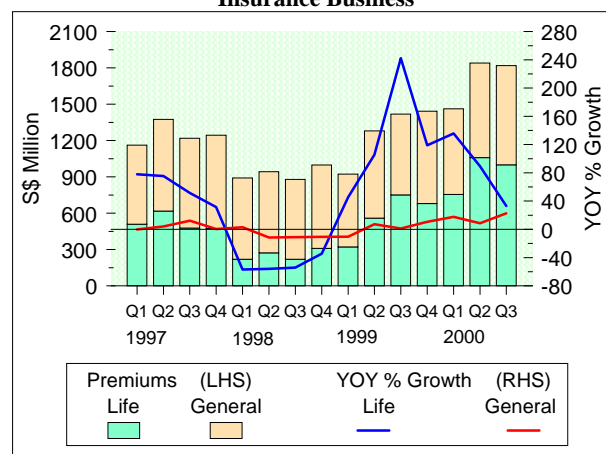
5 Extracted from Ministry of Manpower's press statement on the changes to the CPF Investment Scheme (CPFIS) on 29 Aug 00.

6 The Life Insurance Association has projected sales of single-premium insurance products to almost double next year, following growth of 80% in the first three quarters of this year.

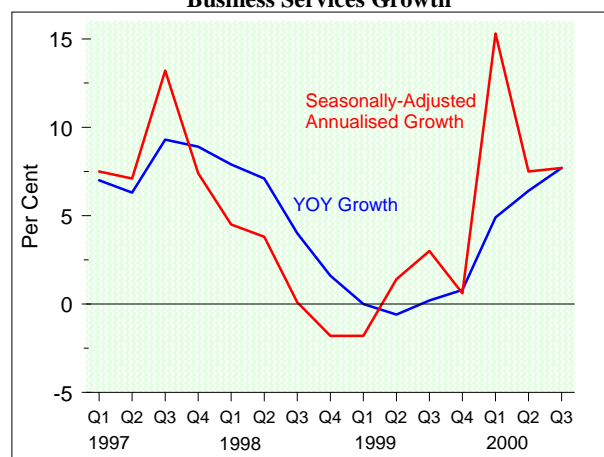
7 Other business services are professions, including accounting & auditing, advertising, engineering, technical, IT, and management consultancy.

8 Net balance is the difference between the performance of firms reporting more favourable performance minus the percentage reporting less favourable performance.

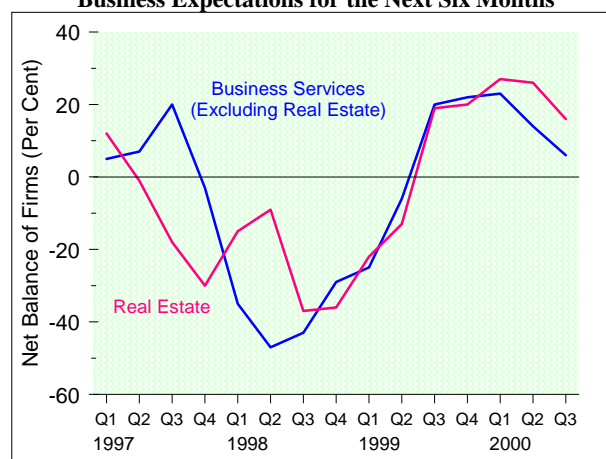
**Chart 2.16**  
Premiums Collected for General Insurance & Life Insurance Business



**Chart 2.17**  
Business Services Growth



**Chart 2.18**  
Business Expectations for the Next Six Months



services, a net balance of 6% of firms anticipated further growth, down from 14% in Q3 and 23% in Q2. Similarly, a net balance of 16% of real estate firms expressed confidence of brisk business, compared to 26% in Q3 and 27% in Q2.

## Commerce

The commerce sector continued its sterling performance of double-digit growth for the fourth consecutive quarter since Q4 1999, on the back of continuing robust growth in the wholesale and retail trade industry. (Chart 2.19) In particular, strong re-exports to the regional economies in recent months were driven by healthy global demand for electronic products and favourable economic conditions in major markets. Retail sales too sustained strong growth this year, boosted by brisk sales of motor vehicles, telecommunication equipment and computers. The continuing strength in the visitor arrivals also supported growth in the hotel and restaurants industry by 9%.

### Visitor Arrivals

Visitor arrivals rose by 11% in Q3, similar to the previous quarter, before slowing to 5.2% in Oct. This brought growth to 11% in the Jan-Oct period. The strong arrivals in Q3 were supported by double-digit growth from ASEAN countries (except for Thailand and the Philippines). (Chart 2.20). Arrivals from the NIEs also increased by 11% in Q3, albeit more moderately compared to an average growth of 24% in the previous four quarters. Slower growth from Hong Kong and South Korea, as well as a decline in the arrivals from Taiwan, contributed to the moderation in growth.

In Oct, arrivals from the NIEs declined for the first time since April last year, dragged down by the sharp contraction in arrivals from Taiwan in recent months. Arrivals from Hong Kong also declined slightly while arrivals from South Korea grew by a modest 9%. Among the ASEAN countries, bad press from the hand, foot and mouth disease (HFMD) could have contributed to reduced arrivals from Malaysia and a double-digit decline from Thailand for the first time this year in Oct 2000.

Among the industrial countries, arrivals from the US strengthened to 11% in Q3 before halving in Oct. Arrivals from Europe also continued to increase in Q3

Chart 2.19  
Commerce Sector Growth

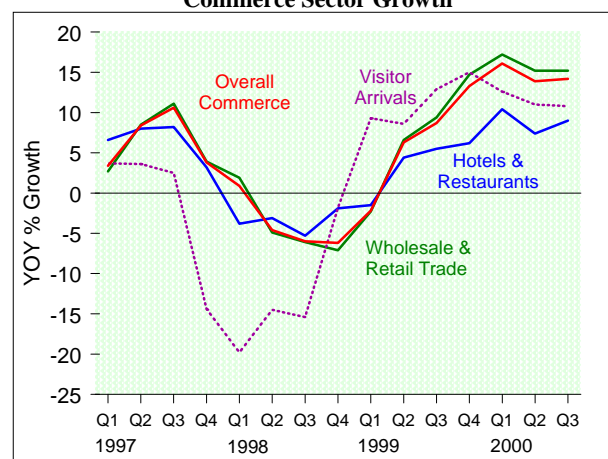
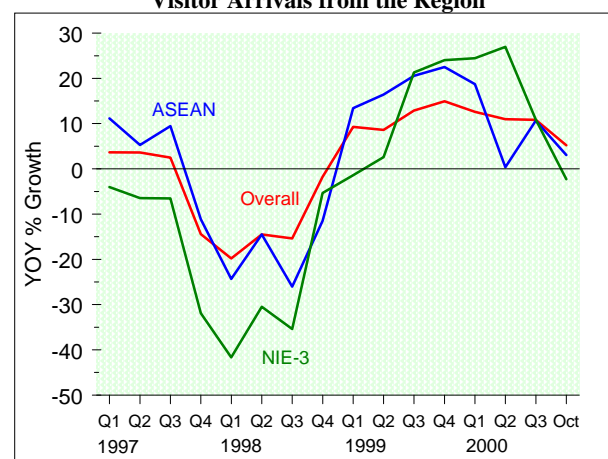


Chart 2.20  
Visitor Arrivals from the Region



and Oct by 4.7% and 2.1% respectively, albeit more moderately compared with the previous quarters this year. Japan and Australia, however, continued to provide strong arrivals through Q3 and Oct. (Chart 2.21)

Some 6.4 million tourists have visited Singapore in the Jan-Oct period this year. This compares favourably with the target of 7.6 million visitors for the whole year set by the Singapore Tourism Board (STB). The STB has recently embarked on a two-and-a-half year "Live It Up" campaign in Sept, following the end of the 15-month-long "MillenniaMania" campaign.

### Hotels/F&B/Retail Industries

Hotel occupancy rates continued to improve in Q3, bringing the average rate to 84% over the Jan-Oct period, compared with 71% in 1998 and 75% in 1999. Hotel room rates also rebounded this year, rising for the third consecutive quarter, and posting growth of 8.1% in Q3. As a result, revenue earned by hotels from letting out their rooms rose by 19% in Jul and 21% in Aug. (See Chart 2.22)

Revenue generated at food and beverage (F&B) outlets, however, weakened sharply in Q2 this year, dragged down by a decline in the revenues collected from hotel-located F&B outlets and independent eating places. Catering trade business (consisting of restaurants, fast food outlets and other eating-places) contracted in Oct following growth of 8% in Q3, which was almost double that in Q2. This mainly reflected a decline in the business at restaurants in Oct following robust growth in Aug and Sept.

Retail sales volume grew by a robust 23% in Q3, following two consecutive quarters of around 29% growth. As before, brisk sales of motor vehicles, which accounted for 26% of the overall retail sales basket, continued to drive the retail sales growth. Excluding motor vehicles, retail sales rose by 5.6% in Q3, supported by healthy sales of wearing apparel and footwear, furniture and household equipment and sales at department stores. (Chart 2.23) Sales of luxury goods, however, fell during this period. Sales of watches and jewellery declined for the third consecutive quarter while sales of recreational goods fell in Q3 for the first time since Q4 98. Sales of telecommunication equipment and computers, however, continued to post remarkable growth for the sixth consecutive quarter, of 49% in Q3. In Oct, total retail sales growth halved, mainly due to

Chart 2.21  
Visitor Arrivals from Industrial Countries

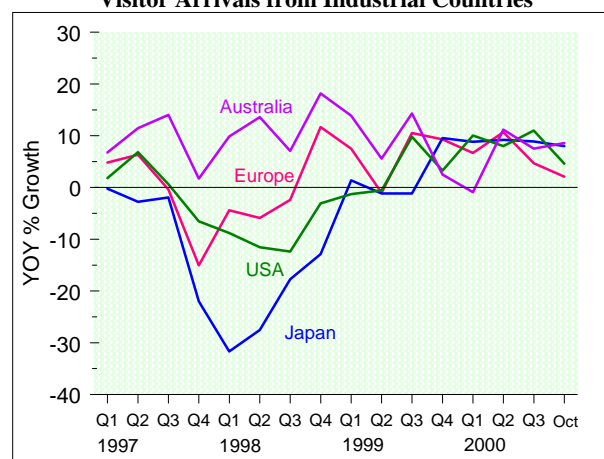


Chart 2.22  
Revenue from Hotels, Catering Trade and Food & Beverage

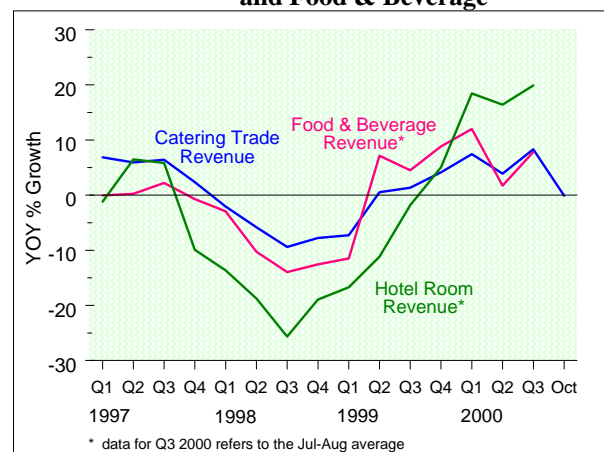
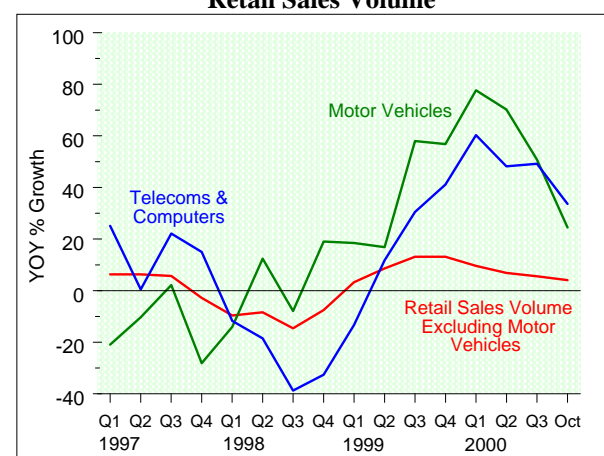


Chart 2.23  
Retail Sales Volume



slower sales of motor vehicles, telecom equipment and computers, as well as a decline in the sales of watches, jewellery, wearing apparel and footwear. (Chart 2.24) This cautious spending pattern of consumers could be attributed to a lacklustre stock market and a slower growth in visitor arrivals.

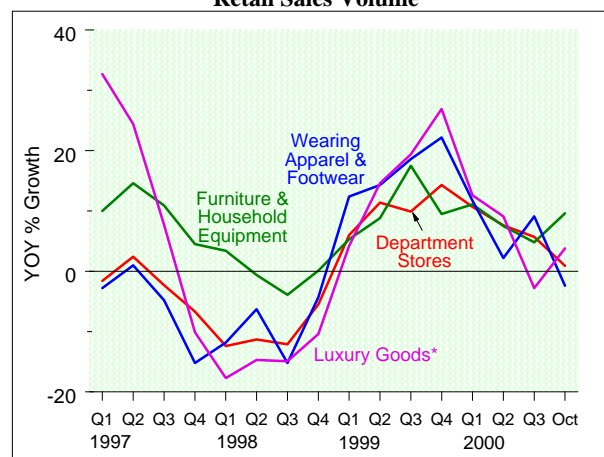
## Transport & Communications

The transport and communications sector grew at a steady rate of 9.2% in Q3 this year, slightly slower than growth of the previous two quarters. (Chart 2.25) Total passenger arrivals and air cargo handled at the Changi Airport grew by 10% and 15% respectively in Q3, while the volume of sea cargo handled rose by a more modest 0.8% due to slower growth in general cargo and a contraction in bulk cargo handled. In Oct, growth of air cargo moderated to 3.4%, while sea cargo strengthened to 2.3% on the back of an increase in bulk cargo.

The post and communications industry continued to record double-digit growth in Q3 and Oct, reflecting continued rapid growth in mobile phone and internet subscriptions. Mobile subscriptions surged 64% in Q3 and by 66% in Oct, compared with an average growth of 54% in the Q1-Q2 period this year and 34% in 1999. This was at the expense of paging subscriptions that continued to decline rapidly, by 25% in Oct. With a total of 2.2 million mobile phone subscribers by Oct this year, the mobile phone penetration rate reached close to 70%. (Chart 2.26) At the same time, internet subscriptions rose by 278% in Oct, almost doubled the subscriber base in Jan this year, to reach a penetration rate of 58%. The subscriber base expanded sharply with the launch of surf-for-free access plans by two major players. Boosted by aggressive rate cuts by new players like Zone Telecom (which has a portal of eight budget call providers), international calls increased by 27% in Oct.

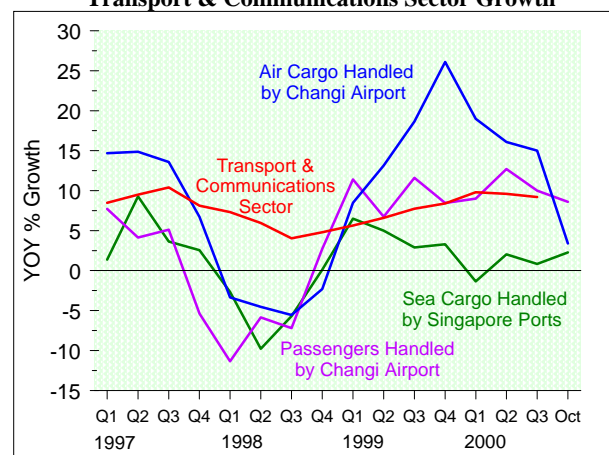
For the coming quarters, the volume of activity in the air and sea cargo segments may be adversely affected in the event of a slowdown in the global electronics cycle. The communications sector, however, is likely to continue growing strongly as the number of players (i.e. content creators, technology providers and service providers) in the local broadband market increase to around 300 this year, from around 200 last year. To further develop the local broadband market, the Infocomm Development Authority of Singapore has indicated that it would provide financial support to broadband operators to quicken the introduction of broadband access to homes and offices. A broadband network is also planned to

**Chart 2.24**  
**Retail Sales Volume**

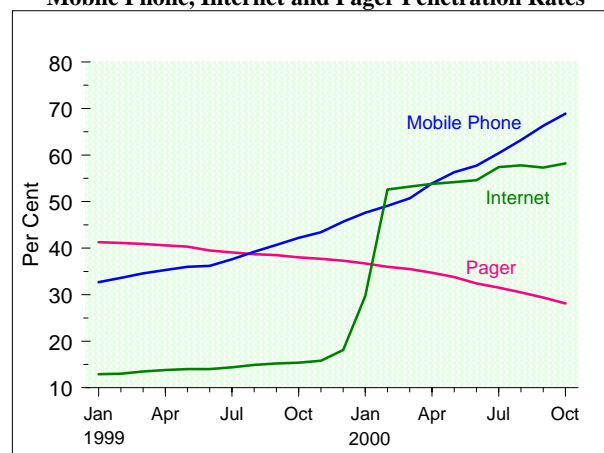


\* Luxury goods consist of recreational goods, watches and jewellery.

**Chart 2.25**  
**Transport & Communications Sector Growth**



**Chart 2.26**  
**Mobile Phone, Internet and Pager Penetration Rates**



connect government agencies and statutory boards. Through these efforts, the government is targeting up to 400,000 users of broadband or high-speed internet access in Singapore by the end of 2001 from around 250,000 in Sep this year.

## Construction

The construction sector continued to decline for the eighth consecutive quarter in Q3. Nevertheless, there were signs of bottoming out as the rate of decline moderated to 1.3% in Q3 compared to contractions of 1.7% and 9.0% in Q2 00 and Q1 00 respectively. In addition, commercial bank loans to the construction sector picked up for the first time since Q4 98, growing by 4.3% in Q3.<sup>9</sup> (Chart 2.27)

Although construction activity in the non-residential sector picked-up for the second consecutive quarter, this was more than offset by the sluggish activity in residential construction.<sup>10</sup> As a result, overall certified payments fell by 10% in Q3. (Chart 2.28)

The increase in certified payments for non-residential construction reflected a surge in private contracts awarded for building plants in the electronics, pharmaceutical and chemical industries, and logistics facilities<sup>11</sup> since 1999. On the other hand, private commercial construction remained weak given the dearth of new commercial land sales since 1998. Public non-residential construction also declined, albeit by a milder 11% compared to a 23% fall in H1 00.

In the residential market, certified payments for both public and private construction activity continued to fall in line with a slow down in the building of new HDB flats and weak demand in the private property market. For the year 2000, the planned number of new public housing units to be built fell by one-third, compared with the average annual supply in the past two years. In the private property market, property prices fell in Q3 and the Real Estate Developer's Association of Singapore

9 From Q1 97 to Q3 00, the correlation between the growth rates of construction value-added and loans extended to the industry is 0.93.

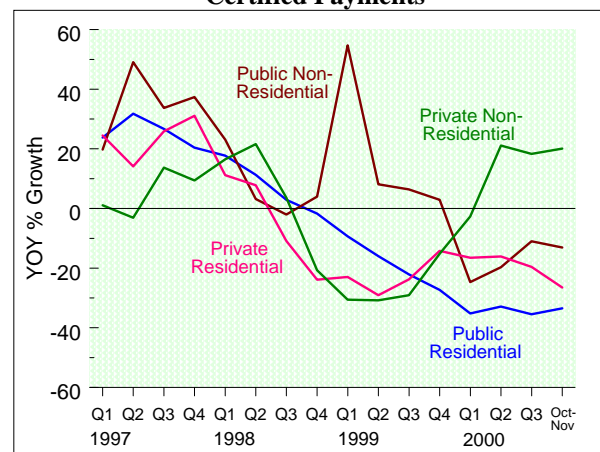
10 The more severe contraction in the residential segment saw its share of construction output decline from 45% in 1997 to 40% in 1999.

11 These plants include Singa Trust, Micron Technology, drug-maker Pfizer and Continental Chemical Corporation.

Chart 2.27  
Construction Value-added and Construction Loans



Chart 2.28  
Certified Payments

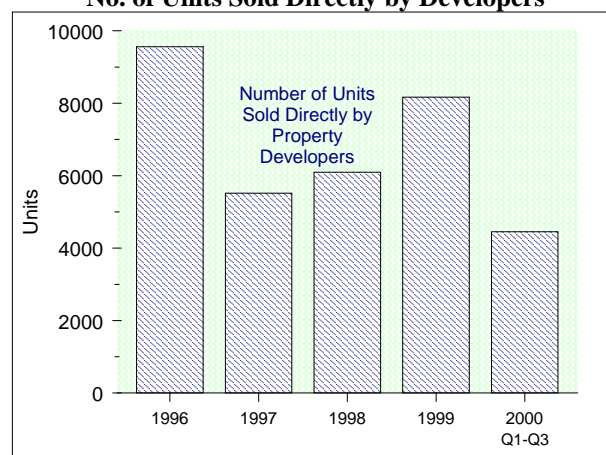


(REDAS) expects the whole year's demand to decline from about 8000 units in 1999 to between 5000 to 5500 units in 2000 (lower than the levels during the Asian crisis in 1997). (Chart 2.29) Further, the stock of private properties under construction, a good indicator of construction activity, has fallen by 10% and 30% compared to 1999 and 1998 respectively. (Chart 2.30)

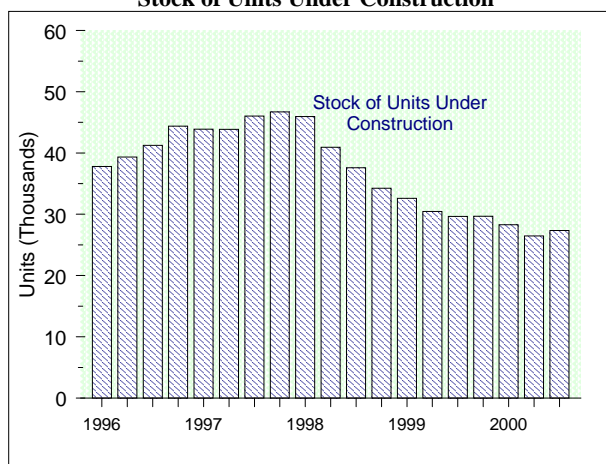
Nonetheless, growth of the construction sector is expected to turn positive in 2001, led by non-residential construction, civil engineering works, and private residential construction. Public construction activity will be supported by non-residential projects such as Airport Logistics Park, JTC's high tech industrial and technology parks, and Tuas View Pharmaceutical Park II.

Contracts awarded, a leading indicator of construction activity, have rebounded strongly this year. In the first ten months of the year, contracts awarded rose to \$16.1 billion, a 49% increase from the same period a year ago. A significant proportion of this was allocated for several large public land reclamation projects – for instance, \$5.1 billion in June for the reclamation of Jurong Island and Tuas View Extension and \$1.8 billion reclamation project in Pulau Tekong and Pulau Ubin in October. Excluding these land reclamation projects, total contracts awarded continued to decline, albeit at a more moderate rate of 15%. The Building and Construction Authority (BCA) expects contracts awarded to total S\$17.3 billion for the whole year. Even in the residential segment, the decline in public contracts awarded has moderated to 3% in Q3, compared to a decline of 70% in the H1 00. Private residential contracts awarded have increased for five consecutive quarters.

**Chart 2.29**  
**No. of Units Sold Directly by Developers**



**Chart 2.30**  
**Stock of Units Under Construction**



## 3 Inflation

Reflecting the narrowing of the output gap, as well as the hike in global oil prices, inflation had shown signs of pick-up in recent months. Consumer price inflation rose to 1.5% in Q3 2000 after a temporary dip to 0.8% in Q2 2000, resuming an up-trend that started in early 1999. Inflation inched up further to 1.8% in October and 2.0% in November, bringing average inflation for the first eleven months of the year to 1.3%. The sharp increase in oil prices also led to a rise in headline CPI inflation in several of Singapore's trading partners.

Looking ahead, the effects of the earlier oil price increases, robust domestic demand and rising labour costs are expected to continue to exert some moderate upward pressure on CPI inflation in the coming months.

### 3.1 External Inflation

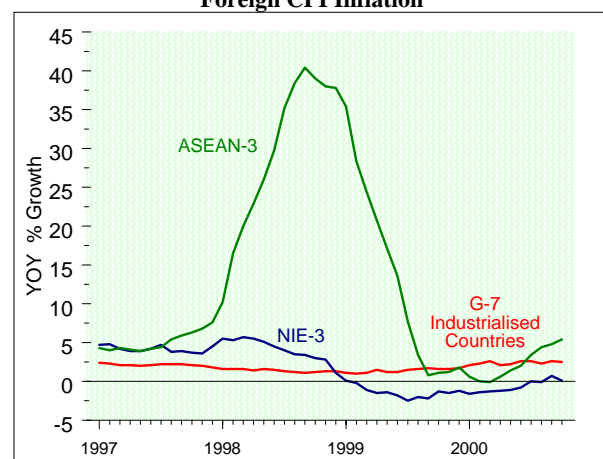
#### Foreign CPI Inflation

As outlined in Section 1.1, foreign inflation rose as most regional and industrial countries faced increasing inflationary pressures from strengthening commodity prices, especially oil. Several of the regional countries also experienced price pressures from strong domestic demand.

Inflation in the ASEAN-3 (Malaysia, Indonesia and Thailand), which has been seeing a steady increase since April, rose to 4.2% in Q3, about 2.9% points higher compared to the previous quarter. (Chart 3.1) In Oct, inflation in these countries increased further to 5.4%. Higher fuel prices pushed up prices, with Indonesia and Thailand recording inflation rates of 6.3% and 2.0% in Jul-Oct, up from 1.2% and 1.6% in Q2 respectively. Malaysia's inflation was, however, almost unchanged, at 1.6% in Jul-Oct. The Malaysian Institute of Economic Research expects the country's inflation to increase in 2001 to 4% on the back of higher oil prices, and 'demand-pull' factors associated with rising wages and improved consumer sentiment.

Notwithstanding its buoyant GDP growth, Hong Kong continued to experience a decline in prices of 2.8% in

Chart 3.1  
Foreign CPI Inflation



\* ASEAN-3 refers to Malaysia, Indonesia and Thailand

Q3 and October, as domestic spending continued to be depressed. Slower consumer spending also moderated Taiwan's inflation to 1.1% in Q3 and 1% in Oct. Consumer prices in Korea however increased by 3.2% in Q3 and 2.8% in Oct after a more muted 1.4% in Q2. Consumer prices of the NIE-3 countries as a whole increased by an average 0.2% in Q3, the first increase since early 1999.

Given their less dependence on oil, the G-7 countries were less affected by the spike in oil prices. Inflation in the G-7 economies has remained fairly steady throughout the year, averaging 2.4% in the first ten months.

### Commodity Prices

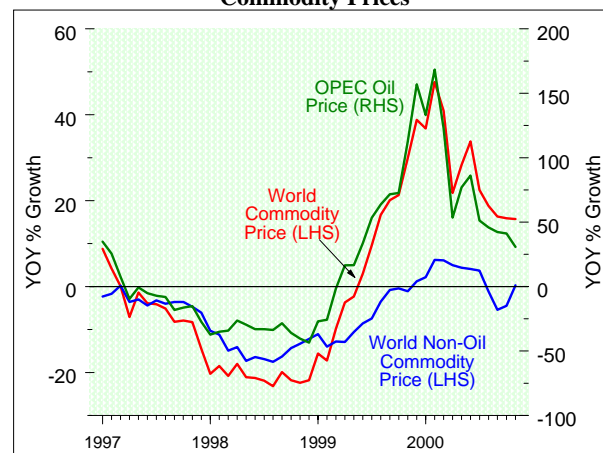
World commodity prices continued to rise by double-digit rates in Q3 and October-Nov as oil prices surged. Non-oil commodity prices, however, declined in Jul-Nov after moderate increases for two consecutive quarters. (Chart 3.2)

The price of oil continued to rise by double-digit rates due to expectations of a supply shortage resulting from political tension in the Middle East, as well as increased demand for heating fuel for winter in the Northern Hemisphere. Most OPEC members are already operating at maximum capacity, while the US is facing bottlenecks at its refineries. OPEC, which pumps 38% of the world's supply of crude oil, has increased production four times this year in an attempt to cool soaring oil prices, bringing oil output to a 21-year high. Thus, most observers expect a sustained fall in oil prices after winter, with OPEC reported to be considering reducing supplies after their coming meeting in Jan 2001. Oil futures have also tumbled, in line with market expectations of falling prices.

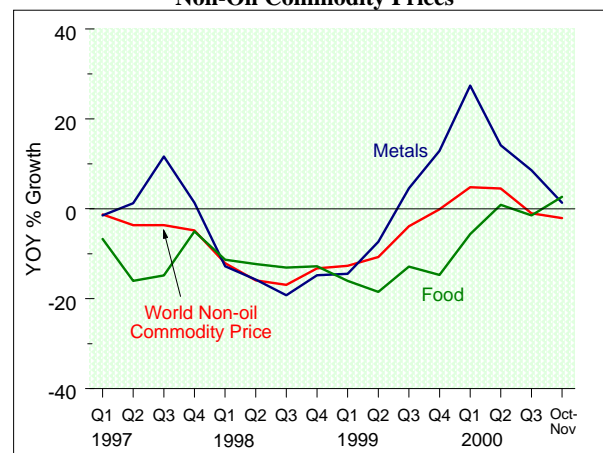
Non-oil commodity prices fell by 1% in Q3 and declined further by 2.1% in October and November, breaking the trend recovery seen since end-1999. (Chart 3.3) All major non-oil commodity groups registered contraction in prices, except for metals, where prices picked up with the recovery in the Asian economies, and a marginal increase in food prices. High fixed costs of production caused producers, particularly those in the food commodities industry, to continue increasing output despite low prices. As a result, this put further downward pressure on prices as stocks rose.

The benign inflation in the food category reflected

**Chart 3.2**  
Commodity Prices



**Chart 3.3**  
Non-Oil Commodity Prices



cheaper coffee, rice and palm oil. The price of coffee continued trend down, contracting by double-digit in July-Nov, due to a supply glut. (Chart 3.4)

Rice prices also continued to fall, from a contraction of 12% in Q2 to declines of 19% in Q3 and 6.5% in Oct. This was due to a lack of demand from large consumer countries, such as Indonesia and Philippines, who have been experiencing bumper rice-crops at home. According to the Thai Rice Mills Association, the recent floods in Thailand have only affected the harvest of glutinous rice, which is largely consumed domestically, and not fragrant rice, which is exported to countries like Singapore.

Indonesian supply of palm oil continued to flood the world market weakening prices further in Jul-Nov. Exports were boosted by the depreciation of the Rupiah and liberalisation of Indonesia's export tax for palm oil. However, palm oil prices may find some support in the near future as the recent acquisition of a large number of palm oil plantation in Indonesia by Malaysia's Guthrie Group is expected to consolidate the production and supply of palm oil across Malaysia and Indonesia, the world's two largest producers of palm oil. Sugar prices, on the other hand, continued to surge. Droughts have caused some disruption in supply from Brazil and Australia. In addition, producer-countries have also been increasing the conversion of sugarcane to fuel, as a cheaper alternative to petrol fuel.

## 3.2 Consumer Price Inflation

### Overall CPI Inflation

Overall CPI inflation rose to 1.5% in Q3 2000, up from 0.8% in the preceding quarter. Inflation inched up further in Oct 2000, to 1.8% and 2% in Nov 2000. (Chart 3.5) The higher CPI inflation in Jul-Nov 2000, compared with Q2 2000, was due to higher inflation of services and non-durable goods. In particular, double-digit hikes were seen in electricity tariffs and petrol prices, as rising global oil prices filtered into domestic prices.

Chart 3.4  
Selected Non-oil Commodity Prices

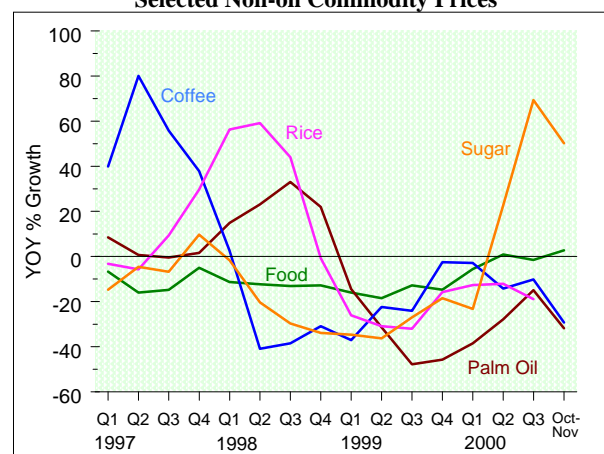
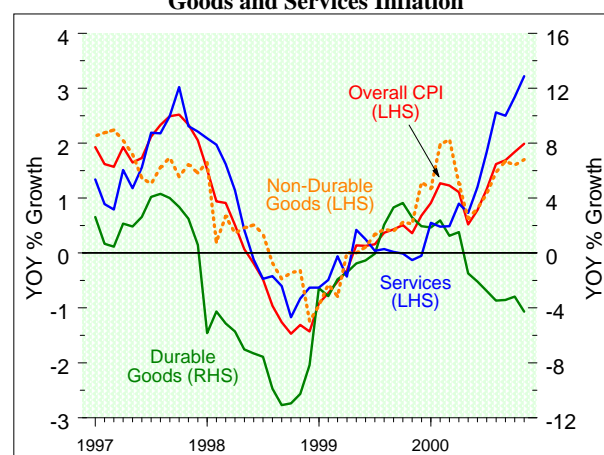


Chart 3.5  
Goods and Services Inflation



## Services Inflation

Services inflation jumped to 2.3% in Q3 2000 and rose further to 3% in Oct-Nov 2000, after a lower 0.9% in Q2 2000. This largely reflected the 31% rise in electricity tariffs in Jul-Nov 2000, on the back of dearer fuel, which accounts for half of the costs of electricity production in Singapore. (Chart 3.6)

Price inflation of public road transport also increased from Q2 2000 to Jul-Nov 2000 due to hikes in bus, MRT and taxi fares in June/July, as transport companies passed on higher operating costs. The education category posted higher inflation as tuition fees for universities were revised upward in July. Inflation of other miscellaneous services, which comprise largely holiday tours, also went up in Jul-Nov 2000, reflecting buoyant consumer demand. (Chart 3.7) After declining for two years, the costs of accommodation increased by 0.4% in Oct-Nov, mirroring the earlier rebound in private residential property prices. (Box Item 2 examines the information content of private residential property and several other asset price inflation for consumer price inflation.)

In contrast, communication costs continued to fall sharply in Jul-Nov 2000, as service providers offered more price-cuts in their bid to gain market share.

## Goods Inflation

Non-durable goods inflation increased to 1.5% in Jul-Nov 2000, up from 0.9% in Q2 2000, largely due to hikes in petrol prices in July and August. At the same time, clothing prices, which had been declining for more than two years due to stiff competition in the retail sector, rose by 0.9% in Jul-Nov 2000. (Chart 3.8) These increases, however, were partly offset by lower inflation of food, the largest category in the CPI basket. The muted food inflation has reflected the increasingly competitive supermarket segment. Costs have been lowered through direct purchasing from cheaper non-traditional markets such as Africa and South-Asia. Low food price inflation is expected to be sustained, particularly as NTUC FairPrice, Singapore's largest supermarket chain, will start operation of a new food-distribution centre in 2002, cutting costs further.

Durable goods prices contracted by 3.4% in Jul-Nov 2000, after a decline of 0.7% in Q2 2000. This was due to the sharp drop in car prices, as COE premiums fell,

Chart 3.6  
Selected Services Inflation

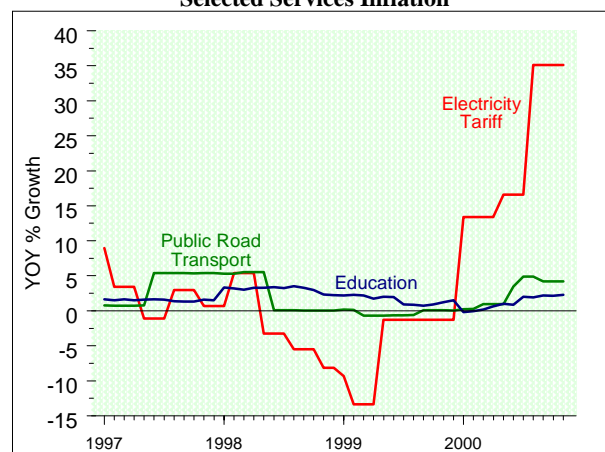


Chart 3.7  
Selected Services Inflation

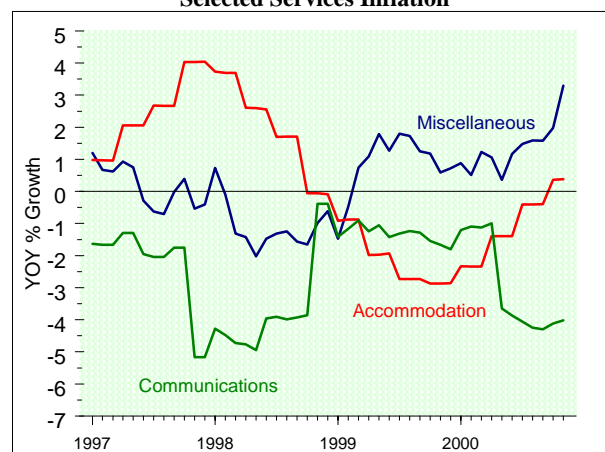
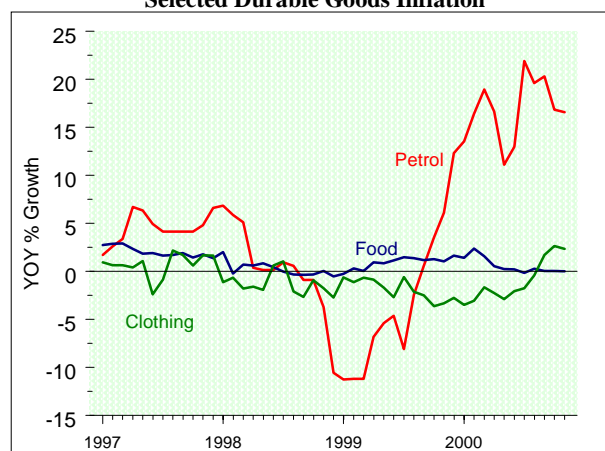


Chart 3.8  
Selected Durable Goods Inflation



from an average of \$42,000 in Q2 to \$36,000 in Jul-Nov 2000. (Chart 3.9)

### Underlying Inflation

To better observe the underlying price trends in Singapore, measures of core inflation are also closely monitored. These measures systematically exclude components that exhibit excessive price volatility from the CPI basket so as to minimise the impact of temporary and idiosyncratic shocks on CPI inflation.

The MAS underlying inflation, which excludes the costs of private road transport and accommodation, rose from 0.9% in Q2 to 1.9% in Jul-Nov 2000. (Chart 3.10) The higher rate as compared to the headline CPI inflation of 1.7% in Jul-Nov 2000 reflected declines in accommodation costs and car prices over the period.

Reflecting the narrowing of the output gap, the volatility-adjusted inflation<sup>12</sup>, median inflation<sup>13</sup> and 30%-trimmed mean inflation<sup>14</sup> also showed a pick-up in Jul-Nov. The volatility-adjusted inflation rose to 1.5 %, up from 0.3% in Q2. The median inflation and the 30%-trimmed mean inflation posted slightly higher inflation rates of 0.5% and 0.7% respectively.

### Other Price Indicators

The GDP deflator measures the prices of net output of the entire economy. This rose by a stronger 3.5% in Q3, up from 2.8% in Q2 (See Chart 3.11), in line with the strengthening demand.

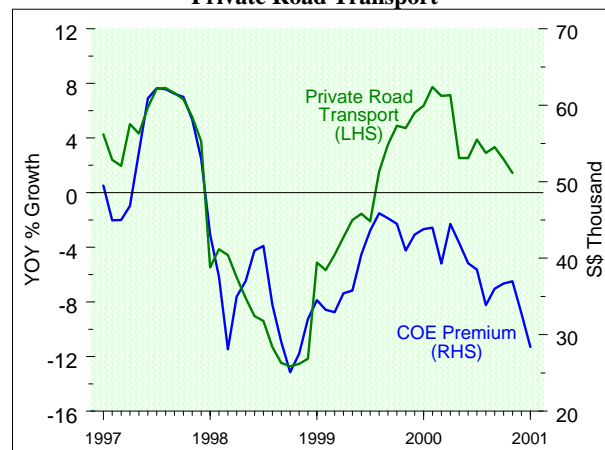
The implicit retail price index on the other hand, continued to decline due to the stiff competition in the retail sector. A large part of the decline was due to the falling retail prices of motor vehicles as well as telecommunication and computer products. However, it

12 The volatility-adjusted inflation is calculated after excluding items that exhibit significant fluctuations in prices.

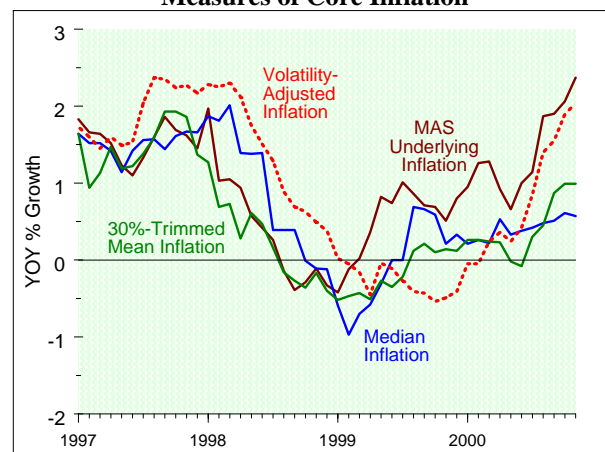
13 The median inflation refers to the 50th percentile inflation rate at which half of the components in the basket has higher inflation and other half lower.

14 The 30% trimmed mean inflation is calculated after removing 15% each of the components with the smallest and largest inflation rates.

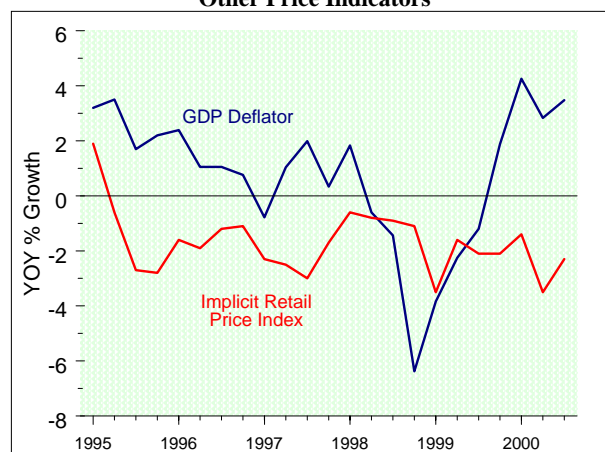
**Chart 3.9**  
**Private Road Transport**



**Chart 3.10**  
**Measures of Core Inflation**



**Chart 3.11**  
**Other Price Indicators**



was somewhat offset by the rise in prices of petrol station services, reflecting the oil price hikes.

### **Outlook for Inflation**

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The effects of the earlier oil price increases, rising labour costs and strong demand are expected to continue to exert upward pressure on CPI inflation in the coming months. CPI inflation is expected to inch up further to average 1.4% for the year as a whole.

We expect this year's oil price hikes to continue to impact CPI inflation in the first half of 2001. On the domestic front, Singapore's output gap is expected to narrow further and turn positive by Q1 next year, implying a tighter labour market and increases in unit labour costs.

However, continued competition in several sectors, including the food, telecommunications and power-generating industries, would help restrain CPI inflation and cap it at 1-2% in 2001.

### 3.3 Asset Price Inflation

#### Property Prices

Private residential property prices fell marginally by 2.7% in Q3 on a quarter-to-quarter basis, following six quarters of consecutive positive growth. As at Q3 2000, private residential property prices remained some 24% below the peak in Q2 96. (Chart 3.12) Landed property prices, which saw the largest correction since 1996, remained 30% lower than the peak, while non-landed property prices were 20% below peak.

The decline in prices reflected weak sentiments in the property market although the number of new units sold in the third quarter picked up to 1,989 units (partly due to new launches) compared to an average of 992 units in the first two quarters of the year<sup>15</sup>. Total demand, however, came up to only 3,972 units in the first nine months of the year, compared to an average of 5,700 units sold for the same period between 1996 and 1999. As a result, the total stock of unsold units (with pre-requisite for sales) edged up to 16,105 in Q3, the highest level in seven quarters. (Chart 3.13) In response to the excess supply situation, the government has moderated the land release programme in 2001 to provide about 6,000 to 7,000 residential units, down from 9,000 in 2000.

Nevertheless, occupancy rate in the private residential property market improved by 1.2% points from the previous quarter to 92.1% in Q3, but remained below the peak of 94.3% in Q4 95. (Chart 3.14) Average rents of prime residential districts also rose marginally, although rents in the suburbs remained flat, according to estimates from property consultants.

In contrast with the languishing private residential property market, office prices and rentals continued to strengthen in Q3, underpinned by strong demand and impending shortage of office space. Since prices and rentals bottomed out in Q4 98 and Q3 99 respectively, prices have risen almost 20% while rentals have gone up by 11%. (Chart 3.15) In Q3, prices increased by 2.1% while rentals edged up by 2.3% on a quarter-to-quarter basis. The gain in rentals and prices came on the back of an improvement in occupancy rate from 86.7% in Q2 to 88.2% in Q3, a level not seen since 98 Q1.

Chart 3.12  
Private Residential Property Price Index,  
Landed, Non-landed

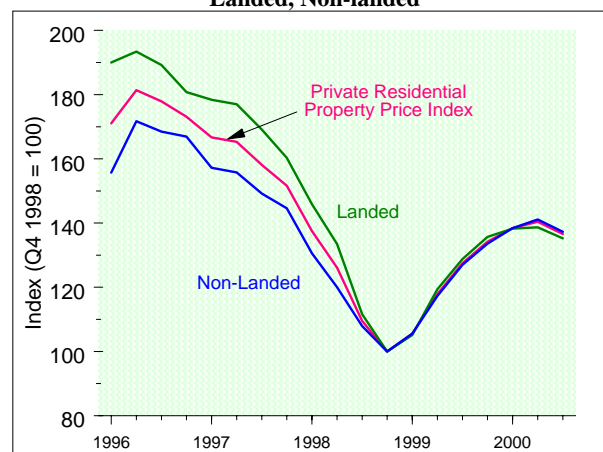


Chart 3.13  
Stocks of Unsold Units

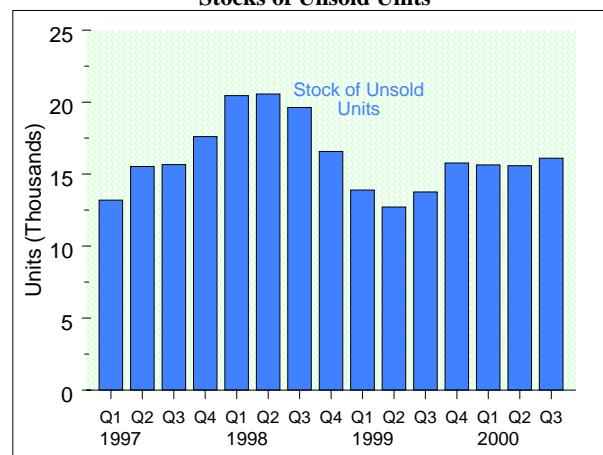
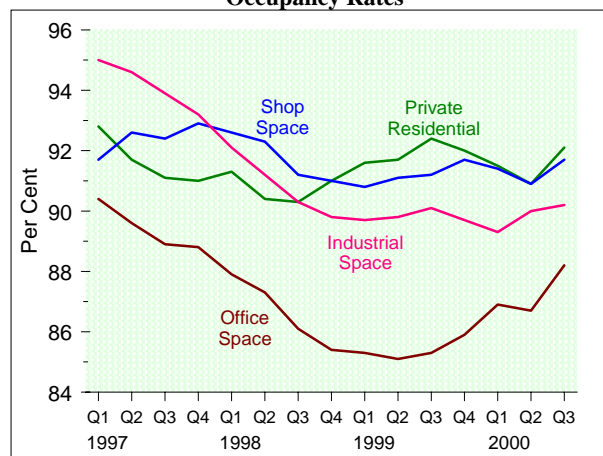


Chart 3.14  
Occupancy Rates



15 The number of new units launched for sale is 3,525, almost three times higher than in Q2.

Similar to the office space, the recovery in shop space has continued on track, with both prices and rentals improving for the fourth consecutive quarter. Reflecting shortage of prime shopping space, occupancy rate rose from 90.9% to 91.7% in Q3. On a quarter-to-quarter basis, prices rose by 4% in Q3 while rentals grew by 1.5%. In the industrial space property market, overall occupancy rates for both industrial and warehouse space improved marginally over the previous quarter, largely due to good take-up of high-tech industrial space. The lack of suitable high-tech industrial space, coupled with the growing demand, has continued to exert upward pressure on rentals. According to estimates from various property consultants, rentals for high-tech industrial space have increased by 6–10% from the previous quarter, pushing rental for overall industrial property up by 2–3% in Q3.

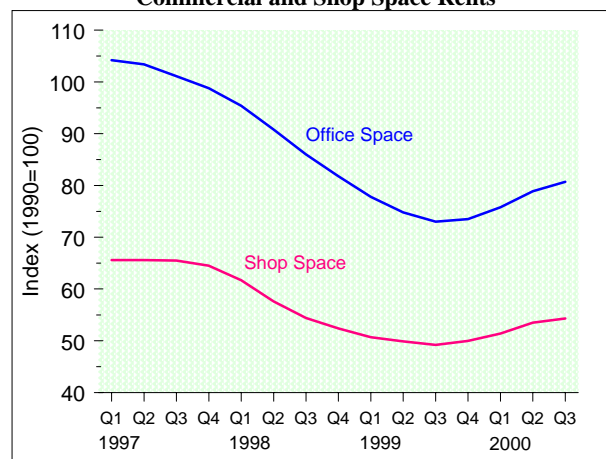
### Stock Prices

Stock prices gained positive ground initially in the first two months of Q3 00. However, these gains were erased in September due to earnings warnings from global technology companies. The STI ended the quarter at the level of 1997, 41 points down from its level at end Q2 2000.

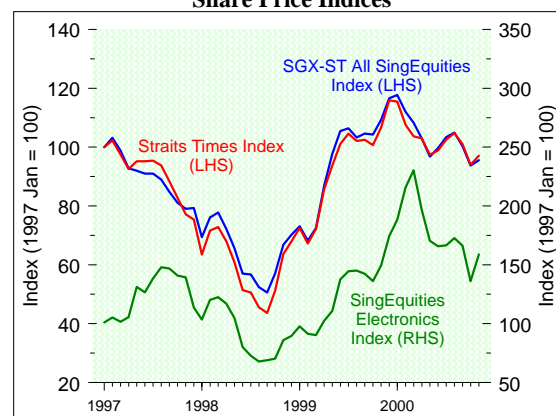
Stock prices consolidated further in July, following the recovery from the sharp fall in April. (Chart 3.16) Towards the end of the month, they came under selling pressure as global tech stocks weakened amidst profit warnings from Ericsson and Agilent Technologies. The stock market rebounded subsequently in August as fears of a hike in the Federal Reserve fund rate receded, following the release of more benign economic US data. In addition, positive local corporate news, such as the JIT-Flextronics merger, boosted market sentiments. As a result, the Straits Times index surged up to its quarterly peak of 2211 points on 22 Aug 00, although it remained 14% lower than the year-to-date peak of 2583 points on 3 Jan 00.

The STI weakened sharply in September, falling in 16 out of 21 trading days and tumbled to its quarterly low of 1933 points on 22 Sep 00. This was due to several external factors, including the weakening euro, soaring oil prices and profit warnings from major US computer companies like Intel and Apple. The losses extended into mid Oct as more technology companies, including Dell, Lucent Technologies and Altera issued earnings warnings. Electronic counters bore the brunt of the losses, with the Singapore Electronics Equities Index

**Chart 3.15**  
**Commercial and Shop Space Rents**



**Chart 3.16**  
**Share Price Indices**



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free-falling to a level not seen since Jun 99. As a result, the STI fell to 1818 points on 17 Oct, barely 25 points above the year-to-date low on 31 May.

In line with the bearish market, average daily turnover declined sharply in Q3. It fell to an average of \$582 million in Q3, compared to an average of \$758 million in H1. Average daily turnover fell to the year's low of \$482 million in September. Turnover improved in the later part of October and November with average daily turnover recovering to \$569 million and \$743 million respectively. STI ended November at 1952 points, on the back of positive earning reports from US technology companies and speculation of mergers and acquisitions of local firms following the sale of Natsteel Electronics to Solectron on 31 Oct 00.

**Box Item: Information Content of Asset Prices in Singapore  
: Some Empirical Evidence**

There is an ongoing debate on whether asset prices should be included in the measure of inflation targeted by monetary policy. Proponents for the inclusion of asset price inflation in monetary policy argue that it provides important price inflation about future trends in the general price level. Monetary policy which focuses solely on consumer price inflation can be misguided as it ignores potential valuable signals about future service flow prices given by asset price inflation. On the other hand, those who argue that monetary policy should not be used to target asset price inflation point to the operational difficulties involved. For example, asset prices are very difficult to forecast, and the relationship between consumer and asset prices tends to be a tenuous one. Moreover, monetary policy tightening consistent with stability in the asset markets may risk excessive deflation in the goods market and hence in the real economy. For such reasons, asset market stability is thought by some to be more appropriately the specific purview of supervisory or prudential policy. This would not only reduce the number of end-objectives on which monetary policy might be brought to bear, but it would have the added advantage of leaving asset markets more resilient to any tightening in monetary policy.

However, central bankers generally agree that developments in asset prices should be closely monitored as part of surveillance of factors that could cause a rise in general inflationary pressures. This has stimulated a proliferation of empirical based studies examining the information content of various asset prices for future movements in consumer prices. The results have been mixed so far. Table 1 below presents some findings from a new influential study by Stock and Watson (2000) for four asset prices, namely term spread, nominal exchange rate, stock prices and house prices in a sample of seven industrial countries.<sup>1</sup>

**Table 1: Information Content of Asset Prices for CPI Inflation in Selected Industrial Countries  
(based on out-of-sample 4-quarter forecasts of first-differenced inflation using bivariate models)**

	US	CANADA	FRANCE	ITALY	GERMANY	UK	JAPAN
<b>Term Spread (level)</b>							
1970-83	✓	-	X	-	X	-	-
1984-98	X	X	X	X	✓	X	X
<b>Exchange Rate (first-difference of log)</b>							
1970-83	-	-	-	-	-	-	-
1984-98	X	✓	X	X	X	X	X
<b>Stock Prices (first-difference of log)</b>							
1970-83	✓	✓	X	X	X	✓	✓
1984-98	X	X	X	X	X	X	X
<b>House Prices (first-difference)</b>							
1970-83	X	-	-	-	-	-	-
1984-98	X	X	-	-	-	X	X

Source : Stock and Watson (2000), "Forecasting Output and Inflation: The Role of Asset Prices", paper presented at conference on *Asset Markets and Monetary Policy*, Stockholm.

- ✓ : Indicator has information content over and above past values of CPI inflation alone, based on relative mean squared forecasting error measure.  
 X : No stable, predictive relationship was estimated.  
 - : Not tested due to unavailable/missing data.

Their results indicate that no single asset price works well across the countries. Moreover, they frequently encountered instances of instability in the asset price-consumer price relationship, as evidenced, for example, by the different results for stock prices across the two sample periods shown. This finding of instability is not unique to their study, but consistent with the wider literature on leading indicators of inflation in the past two decades for industrialised countries.

Among the four indicators above, stock prices performed best, although this was only in the earlier sample period of 1970-83.

<sup>1</sup> Stock and Watson (2000) employed the "h-step ahead" projection of (first-differenced) CPI inflation based on bivariate and trivariate regressions that either include the past values of CPI inflation alone or the past values of CPI inflation and one asset price inflation (with output gap included as a base predictor in the trivariate case).

Their negative results for stock prices in the later sample period confirm similar findings by Goodhart and Hoffman (1999)<sup>2</sup> for twelve developed countries. There appears to be marginal support only for the term spread from the above results, consistent with other works such as by Kozicki (1997)<sup>3</sup> and Estrella and Mishkin (1998)<sup>4</sup>, who found little or no predictive content in the term spread.

The exchange rate seems to work for Canada alone and only in one of the two sample periods, not unlike the finding by Goodhart and Hoffman, who found the exchange rate to have predictive power only in two or three countries. While Stock and Watson's out-of-sample results appear to rule out house prices as a useful indicator, Goodhart and Hoffman found their constructed residential housing inflation to have significant in-sample predictive content in several of the twelve economies that they studied.

We have replicated the Stock and Watson methodology for assessing the information content of asset prices in Singapore. Our study examined five asset prices: term spread (difference between 5-year government bond yield and 3-month SIBOR), nominal effective exchange rate or NEER, Singapore Exchange All-Equities Index, private residential property prices and interest rate spread (difference between 3-month US\$-SIBOR and 3-month S\$-SIBOR).

Table 2 below summarises our out-of-sample forecast results for three forecasting horizons: 2-, 4-, 8-quarters ahead. The statistical measure for assessing information content is the mean squared forecasting error (MSFE) obtained from regressions that include each of the asset prices compared to the MSFE from auto-regressive models, which only contain past values of CPI inflation. The aim is to determine if there is additional information to be gained from these asset price variables over and above those provided by past values of CPI inflation itself in predicting future values of general price increases. The sample period included observations from Q1 1988 to Q4 1995 for estimation, and Q1 1996 to Q1 2000 for forecasting.

Table 2: Information Content of Asset Prices for CPI Inflation in Singapore

	2-quarters	4-quarters	8-quarters
Term Spread	X	X	X
NEER	✓	✓	✓
Stock Prices	✓	✓	X
Property Prices	X	X	X
Interest Rate Spread	✓	X	X

- ✓ : Indicator has information content over and above past values of CPI inflation alone, based on relative MSFE measure.  
 X : No stable, predictive relationship was estimated.

From the above, there appears to be a stable relationship between change in the NEER and future CPI inflation. For all three time-horizon, including the NEER helps to reduce the forecast errors of CPI inflation. Also, predictive models with the NEER as a base predictor (i.e. regressions which contain past values of CPI inflation, change in the NEER as 'control' and one of the other asset price inflation) provide a framework for inflation forecasting which proves to be better than simple models that only include lagged values of CPI changes. Both the interest rate spread and stock returns prove to be useful indicators for only 2-quarters ahead forecasts. Stock returns also contain information on inflation one-year ahead. It also has predictive power for the MAS underlying inflation for the same time horizon. Although property prices were found to contain statistically significant in-sample predictive power, we were unable to demonstrate its forecasting ability for inflation out-of-sample. This is indicative of substantial degree of instability in the relationship between property prices and consumer prices over time. Similarly, the term spread has some in-sample predictive power but performs poorly out-of-sample. We found further evidence of instability in the relationships when we tried to vary the sample period.

In sum, our results have confirmed the usefulness of the NEER as the intermediate target of monetary policy in Singapore. Stock market returns and interest rates also have marginal predictive content for CPI inflation, especially in the short-term horizon of about two to four quarters. While more work would be needed to substantiate the formal inclusion of asset prices in our monetary policy framework, the above findings suggest that some of them could serve as additional useful indicators of inflationary pressures in Singapore. Further improvement could be gained by pooling information from the various asset prices, instead of looking at these indicators individually, as recommended by Stock and Watson. In the light of our results, ED will be monitoring these indicators as part of our surveillance of general price pressures in the Singapore economy.

2 Goodhart, C. and B. Hoffman (1999): "Asset Prices and the Conduct of Monetary Policy," *manuscript, London School of Economics*.

3 Kozicki, S (1997): "Predicting Real Growth and Inflation with the Yield Spread," *Federal Reserve Bank of Kansas City Economic Review* 82.

4 Estrella and Mishkin (1998): "The Predictive Power of the Term Structure of Interest Rates in Europe and the United States: Implications for the European Central Bank," *European Economic Review* 41.

## 4 Labour Market

In line with robust economic growth highlighted in Section 2, the labour market tightened further in Q3 2000, with employment and wages rising at a rapid pace. Continued strength in labour demand and a fall-off in retrenchments led the unemployment rate down sharply. Unit labour costs edged upwards, in line with higher wage growth and the Apr 2000 hike in employers' CPF contribution rate. Employment is expected to continue to expand, albeit at a slower rate, with the moderation of the economy in 2001.

### 4.1 Employment

In Q3, more than 30,000 jobs were added to the economy. This brings the average quarterly number of jobs created in the period Q1-Q3 to around 24,500, close to the average of 27,700 in the period 1995-97. (Chart 4.1)

The services sector added 17,291 jobs on a net basis in Q3, more than half of total net jobs gained. As in previous quarters, the community, social & personal services industry, and the business services industry accounted for most of the net employment gains.

Employment in the manufacturing sector has also picked up rapidly since Q2 2000. Over the past two quarters, the manufacturing sector registered net job gains averaging 8,800 per quarter, compared with 1,800 per quarter in the period Q2 1999 to Q1 2000. Within the manufacturing sector, more than two-thirds of the net jobs gained accrued to the electronics, machinery and transport equipment industries. In particular, electronics employment started picking up with a lag of two quarters after local electronics production rebounded strongly in line with a global upturn in demand. There were also positive spillover effects in employment creation in related industries such as the machinery and transport equipment industries.

Construction employment has turned around as well, with the sector registering modest net job gains in the past two quarters after seven quarters of trend decline. (Chart 4.2)

Chart 4.1  
Employment Changes & GDP Growth

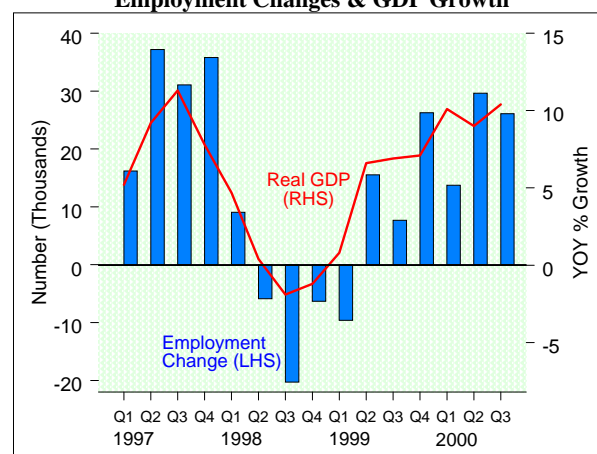
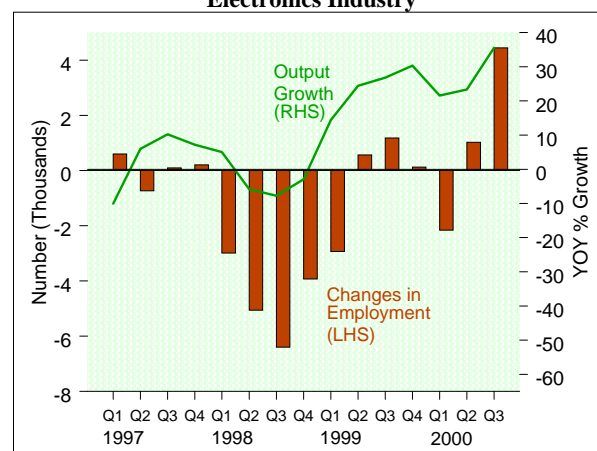


Chart 4.2  
Employment Changes and Output Growth in the Electronics Industry



The recruitment rate has recovered to its pre-crisis rate, reaching 3.4% in Q3 2000. The vacancy rate has picked up gradually as well, more than doubling to 3.1% in Q2 2000 from its trough in end-1998. (Chart 4.3) In addition, retrenchments, which averaged more than 4,300 in the period Q2 1999 to Q1 2000, has fallen sharply to under 2,000 in the past two quarters. This largely reflected a respite in layoffs from the disk drive industry as most of the major retrenchment exercises were completed in Q1. (Chart 4.4) Strengthening labour demand and the fall-off in retrenchments led the seasonally adjusted unemployment rate down sharply, to 2.5% in Q3, from 3.5% in Q2. Without adjusting for seasonal factors, the unemployment rate stood at 2.1%.

## 4.2 Earnings, Productivity and ULC

Nominal earnings rose by a robust 8.7% in Q3 2000, implying average growth of 8.0% for the first three quarters of the year. Both the services and manufacturing sectors saw strong growth in nominal earnings of 8-9%, while growth in the slowly recovering construction sector remained weak. In real terms, overall earnings rose by 7.1% in Q3 2000. (Chart 4.5)

At the same time, productivity continued to moderate from its cyclical high in Q2 1999, slowing down to 5-6% growth in Q2 and Q3. This reflected slower productivity growth in both the manufacturing and services sectors. The decline in productivity growth, coupled with strong growth in nominal earnings and a 2% hike in the employers' contribution rate led to a 2-3% increase in unit labour costs in Q2 and Q3, after six quarters of decline or negligible growth. Unit labour costs in the manufacturing sector, however, continued to decline, albeit at a more moderate rate. This was underpinned by still-strong productivity growth in the manufacturing sector, which remained high at around 12%, about twice the historical average of around 7%.

Labour demand is expected to remain strong in the near-term, with surveys by EDB and DOS indicating that employers in both the manufacturing and services sectors continue to be optimistic about business conditions in Q4 and are looking to hire more workers. Within the manufacturing sector, employment prospects are particularly bright in the electronics industry while within the services sector, more than 70% of job openings are in the commerce, business services and transport & communications industries. Next year, employment is expected to continue to grow, although at a slower pace given the projected moderation in economic growth.

Chart 4.3  
Vacancy & Recruitment Rates

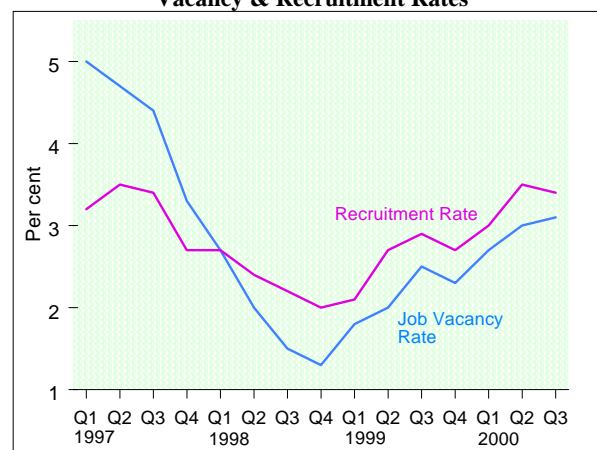


Chart 4.4  
Unemployment Rate & Retrenchments

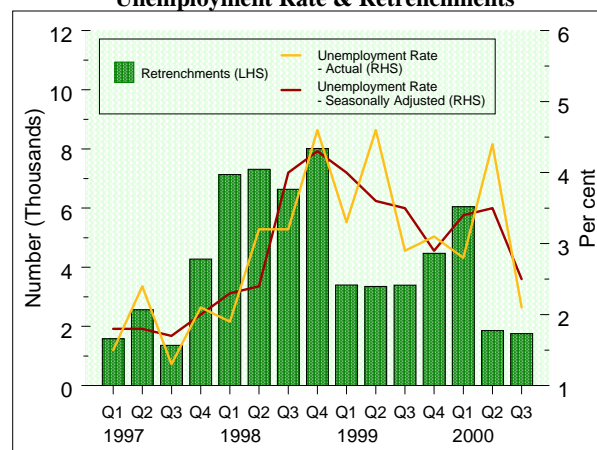
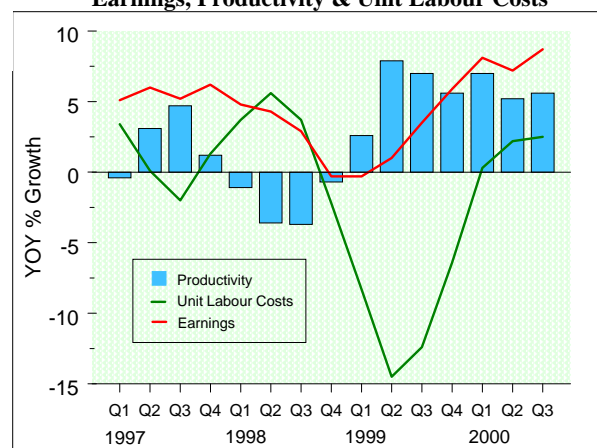


Chart 4.5  
Earnings, Productivity & Unit Labour Costs



## 5 Money and Credit

### 5.1 Monetary Aggregates & Domestic Credit

Broad money aggregates, M2 and M3, contracted in Q3 2000, continuing the trend deceleration in growth seen since the beginning of the year. The contraction in M3, by 1.9%, largely reflected the decline in fixed and savings deposits with commercial banks. Demand deposits, on the other hand, continued to expand to support the 10.3% growth of narrow money, M1. (Chart 5.1)

The decline in broad monetary aggregates is rather unusual given the brisk economic expansion, as demand for money typically rises in tandem with economic activity. The fall in monetary aggregates could reflect tight monetary conditions, a decline in the role of banks in intermediating and/or increased consumption leading to imports.

Monetary conditions in Singapore have not significantly changed since mid-1999. The benchmark 3-month interbank interest rate has remained at about 2.5%. Reserve money has also been basically unchanged from levels in 1999. Indeed, banks continue to have more than adequate liquidity as indicated by the loan to deposit ratio, which has remained below 1.0 despite a recent uptick. (Chart 5.2) More recently, banks have also seen a net inflow of funds from abroad.

Thus a more likely explanation for the contraction in monetary aggregates is the reversal of funds that flowed into bank deposits, especially time and savings deposits during 1997-98. During the Asian crisis, resident investments overseas slowed sharply. Instead, continued confidence in the domestic banking system and higher deposit rates boosted inflows to longer-term bank deposits. (In comparison, during the last recession in 1985, deposit growth slowed in line with economic activity.) Reflecting the increased demand for larger money balances, non-bank resident wealth held in bank deposits rose in proportion in this period. Consequently, the income velocity of money fell to 0.79 in Mar 99 from 0.91 at end-97. (Chart 5.3) In effect, during the crisis, the current account surplus was largely recycled through interbank flows out of Singapore.

Chart 5.1  
Monetary Supply

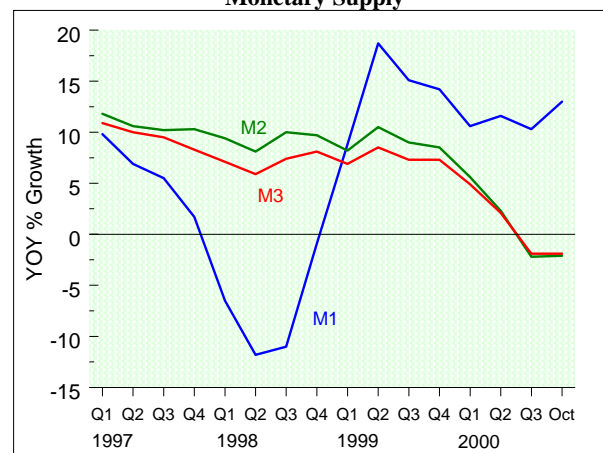


Chart 5.2  
Loan to Deposit Ratio

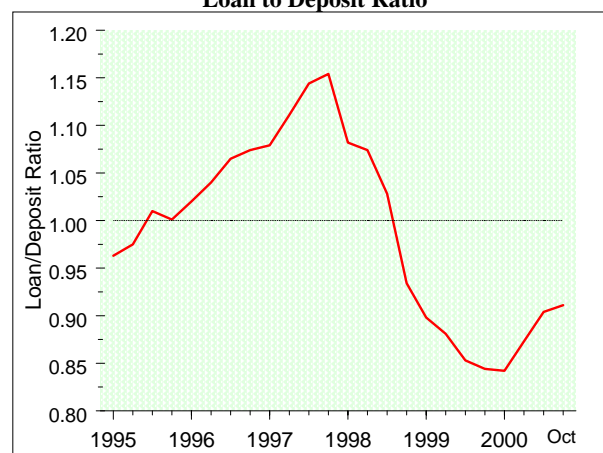
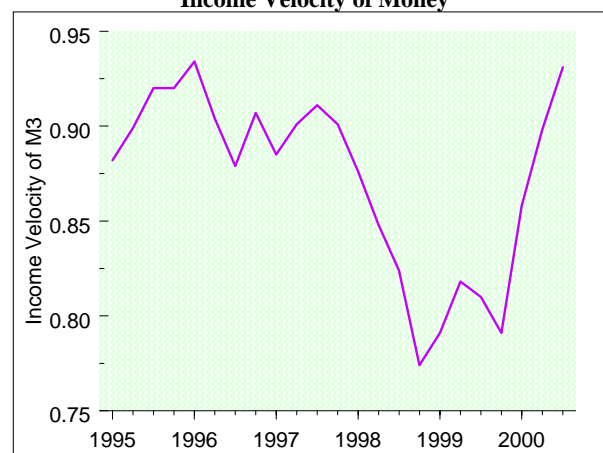


Chart 5.3  
Income Velocity of Money



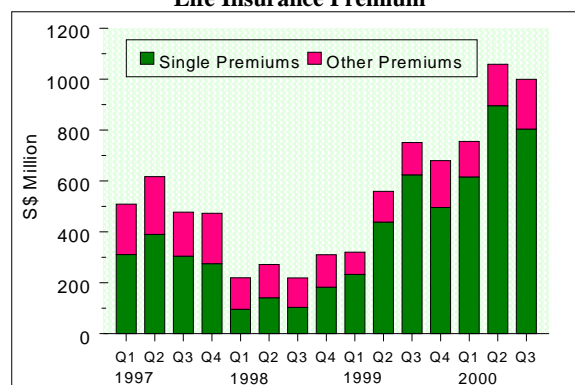
With the improved economic outlook in 1999 and lower deposit rates, residents began to turn to other investments. Inflows to bank deposits slowed noticeably in 1999 although there was some increase in the last quarter of the year. Since the beginning of 2000, however, fixed and savings deposits placed with banks have declined, boosting income velocity of broad money back beyond 0.90. Further, there appears to be an increase in funds moving to non-deposit investments such as unit trusts. Investment-linked insurance products have also been popular, boosting overall premiums paid in life insurance<sup>16</sup>. (Chart 5.4) In addition, corporate investments overseas have risen in line with the regional recovery as well as the increased emphasis on international expansion. Another contributory factor to the contraction in broad monetary aggregates could be a sharp increase in durable goods purchases, such as motor vehicles, in the past few quarters.

A further indication of a decline in bank-led intermediation compared to 1998-1999 can be seen on the asset side of banks' balance sheet. Banks' net foreign assets have contracted in 2000. (Chart 5.5) As noted earlier, this reflects reduced bank intermediation of current account surpluses. In 1998-99, banks repaid their foreign borrowing and, later, deposited funds offshore. However, there has been a reversal in 2000, with banks retrenching their offshore loans, as well as taking in increased deposits from non-residents.

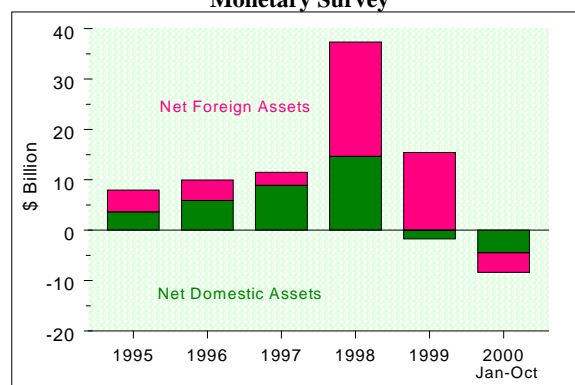
In addition, domestic credit growth remained weak, in part because of growing direct fund raising by corporations. As at the end of October, credit grew by 4.0%. Although lending to professionals and private individuals, and housing loans grew at 13% and 10% respectively, that to other industrial sectors are picking up more slowly. Credit extended to the manufacturing declined by 0.3%, while loans to the commerce and transport and communications sectors also fell, by more than 2.0%. On the other hand, the amounts of funds raised through the capital market have accelerated in the midst of strong demand for new issues of bonds and shares. (Chart 5.6 & 5.7) This observation, however, has to be qualified: direct financing may not be supplanting bank loans as companies raising funds through IPOs and bonds may not have borrowed anyway.

<sup>16</sup> Broad monetary aggregates do not include funds in i) unit trusts, ii) investment linked savings or iii) non-bank financial institutions apart from finance companies.

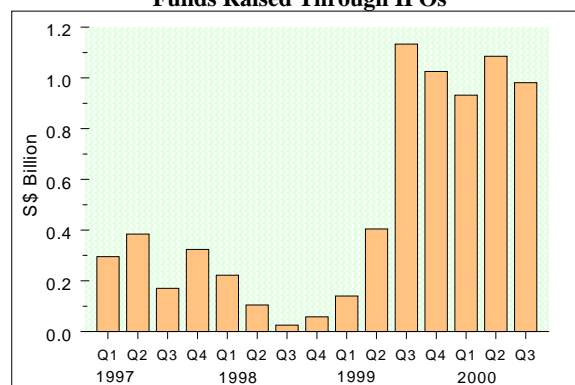
**Chart 5.4**  
**Life Insurance Premium**



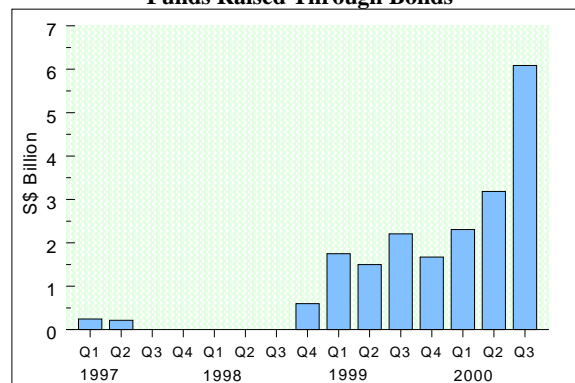
**Chart 5.5**  
**Monetary Survey**



**Chart 5.6**  
**Funds Raised Through IPOs**



**Chart 5.7**  
**Funds Raised Through Bonds**



### 5.3 Interest Rates

The benchmark Singapore dollar 3-month interbank rate was largely unchanged at the end of Q3, compared with Q2. After a brief increase to 2.56% in July, the interbank rate fell back to 2.50% in August and remained at that rate in September. (Chart 5.8)

US interest rates eased in July following the Federal Reserve's decision not to tighten monetary policy at the end of June. The 3-month US\$ SIBOR fell from its opening of 6.78% to 6.72%. It continued its downward trend in August, easing to 6.68% as the Fed again left interest rates unchanged, citing indications of slowing economic activity as well as continued gains in productivity. However, US rates blipped up in the last month of Q3, to 6.81%, partly reflecting the upward revision to US second quarter GDP growth, renewing anxieties of monetary tightening. With the increase in US rates, the differential between the US\$ and S\$ 3-month interbank rate widened to 4.31% in Q3, from 4.28% in Q2. The differential narrowed over Oct-Nov to below 4.00%, largely due to the increase in the S\$ interbank rate to 2.75% at end-Nov.

Retail interest rates in Singapore moderated in Oct, following stable rates for most of the year. The prime lending rate fell to 5.80%, from 5.85%, while the 12-month fixed deposit rate moderated to 2.42% from 2.46%. These retail rates were unchanged in Nov.

Yields of Singapore Government Securities trended down across most maturities over Jun-Nov. In particular, yields on the five-year, seven-year and ten-year papers declined by between 36 and 50 basis points. (Chart 5.9) This partly reflected the impact of the reverse auction operations conducted by MAS in Nov. Yields on the shorter end declined much less or were higher, thus flattening the yield curve over the period.

Chart 5.8  
Interest Rates

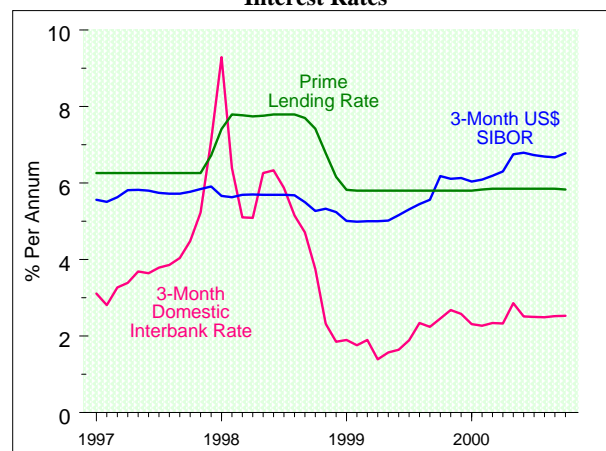
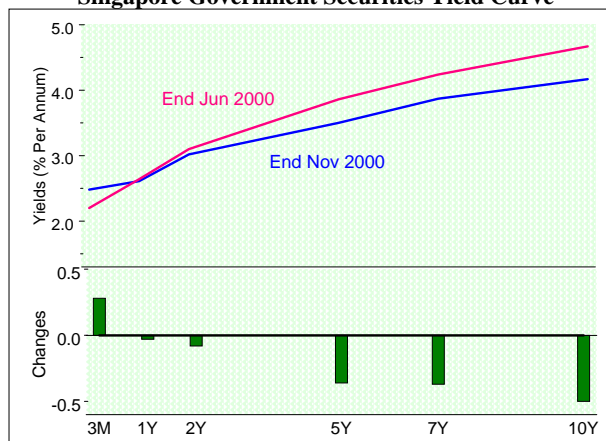


Chart 5.9  
Singapore Government Securities Yield Curve

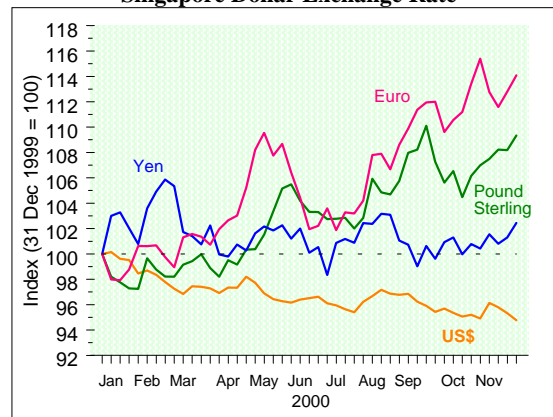


## 5.4 Exchange Rates

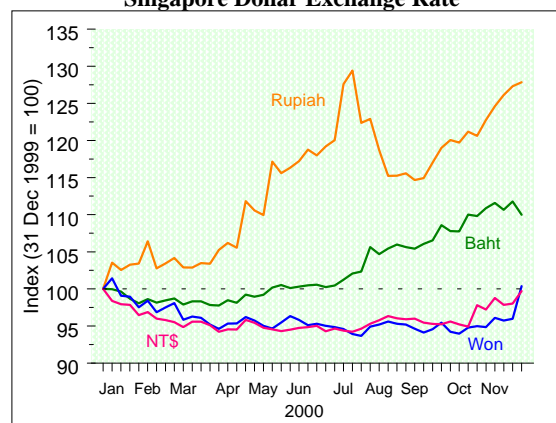
The Singapore dollar appreciated strongly against most major currencies except the US\$ in Q3. (Chart 5.10) Reflecting the deterioration in sentiment against most regional currencies, the Singapore dollar also weakened, by 0.7%, against the greenback. However, against the Euro and Pound Sterling, the local currency strengthened by 7.4% and 3.0% respectively, as concerns about weaker growth and the peaking of interest rates plagued the EU nations. Against the Yen, the Singapore dollar appreciated by a more moderate 1.7%.

Vis-à-vis the regional currencies, the Singapore dollar's performance was mixed. (Chart 5.11) It appreciated against the Baht, by 7.3%, but was unchanged against the Rupiah. The Singapore dollar also appreciated against the New Taiwan dollar, by 1.0%. Against the Korean Won, and the US\$-pegged Hong Kong dollar and Malaysian Ringgit, it depreciated by 0.6-0.7%.

**Chart 5.10**  
Singapore Dollar Exchange Rate



**Chart 5.11**  
Singapore Dollar Exchange Rate



## 6 Fiscal Balance

### 6.1 Overall Balance

The government's fiscal position continued to improve in the third quarter of 2000, in tandem with the strong economic growth in Q3 2000. Its surplus<sup>17</sup> reached a high of \$5.3 billion, which is equivalent to 12.5% of GDP, compared with \$3.5 billion (8.7% of GDP) recorded in Q2. The increase in the surplus reflected the coincidence of a larger operating revenue and decline in expenditure in the quarter. (Chart 6.1)

Despite a deficit in Q1, accumulated surpluses for Jan-Sep 00 reached \$7.2 billion, almost double that for the whole of 1999. On a fiscal year basis, the government had accumulated \$8.8 billion in the first two quarters of the FY2000, up from \$6.3 billion over the same period in FY99.

### 6.2 Operating Revenue

Total operating revenue increased by 10% year-on-year, exceeding \$10 billion in Q3, the largest amount of revenue collected in a quarter. The increase was largely due to a 13% rise in income tax collection, which accounted for almost half of the total operating revenue. (Chart 6.2) This follows a double-digit expansion in Q2 of 30%. Total income tax reached \$5 billion in Q3, as both personal and corporate income tax collections increased, reflecting a pick-up in employment and income growth in the year of assessment 1999. A survey by the Department of Statistics also indicated that the top 10% of households' monthly income rose from \$15,053 in 1998 to \$15,451, while companies saw higher profits.

Various indirect tax revenue collections rose in tandem with the robust growth in retail sales. Motor vehicle tax collection grew by a strong 53%, to \$543 million, as car sales surged. (Chart 6.3) In fact, for the first nine months of 2000, revenue from motor vehicle taxes jumped to \$1.6 billion from \$983 million over the same period in 1999. The strong retail sales also led to an expansion in customs & excise tax revenue by 17% in

<sup>17</sup> The surplus is defined as operating revenue less total expenditure.

Chart 6.1  
Government Finance

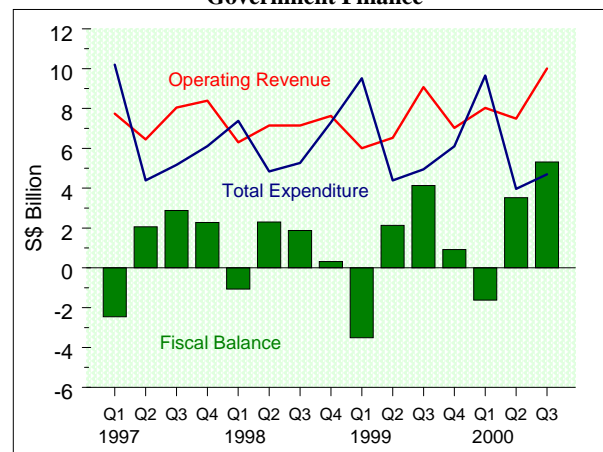


Chart 6.2  
Tax Revenue

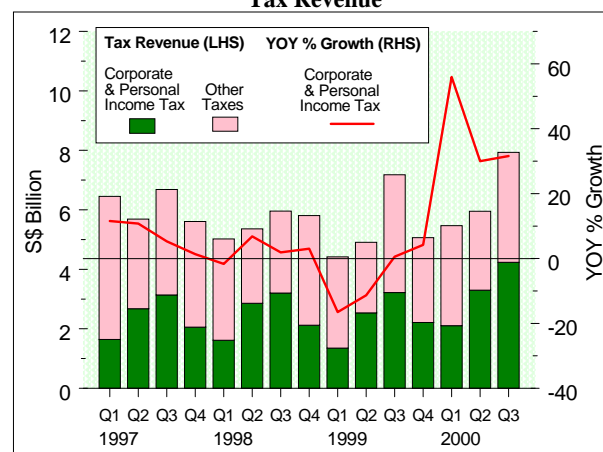
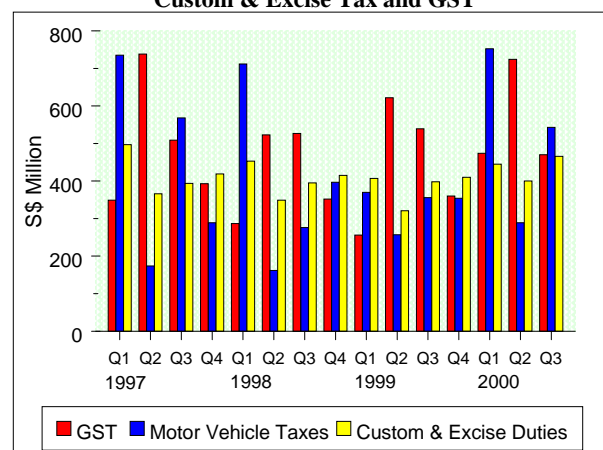


Chart 6.3  
Revenue from Motor-Vehicle Taxes,  
Custom & Excise Tax and GST



Q3, albeit a moderation from the 25% growth in the quarter before.

GST collection, however, declined by 13% in Q3 after recording increases of 85% and 16% in Q1 and Q2 respectively. This could have been due to the reimbursement to retailers, of GST paid on goods purchased in anticipation of stronger sales in Q4.<sup>18</sup> Hence, despite robust growth in retail sales, the repayment of GST to retailers partly offset the GST collected from consumers.

Following double-digit growth since Q3 99, revenue from stamp duty declined by 8.5% to \$354 million in Q3 00. (Chart 6.4) The lower stamp duty collection was partly due to fewer new properties sold in Q3 00, compared to a year ago. In addition, the strong growth in the previous quarters also reflected the low base in 1998, as stamp duty on property purchases was allowed to be deferred until the receipt of Temporary Occupation Permits. Revenue from the "Others" category continued to decline partly as a result of the lower collection from the foreign worker levy, as there were fewer work permits allocated to the construction sector.

Despite slower growth in revenue from fees & charges due to lower COE premiums, non-tax revenue collection picked up by 9.4%. (Chart 6.5) This reflects a smaller contraction in revenue from miscellaneous 'Other Receipts', including interest on loans to statutory boards.

## 6.3 Total Expenditure

Total expenditure dipped by 5.1% year-on-year, to \$4.7 billion in Q3, as the contraction in development expenditure more than offset the expansion in operating expenditure. (Chart 6.6)

Operating expenditure rose by 13% to \$3.2 billion, with most categories registering increases. The government's wage bill was higher as the employers' contribution to CPF was partly restored. This was coupled with a wage revision and higher bonuses paid out to civil servants in July compared to previous year. A large part of the increase in operating expenditure was in social and community

18 GST paid by the retailers on their goods can be claimed from IRAS as only final consumption is taxed.

Chart 6.4  
Revenue from Stamp Duty and Other Taxes

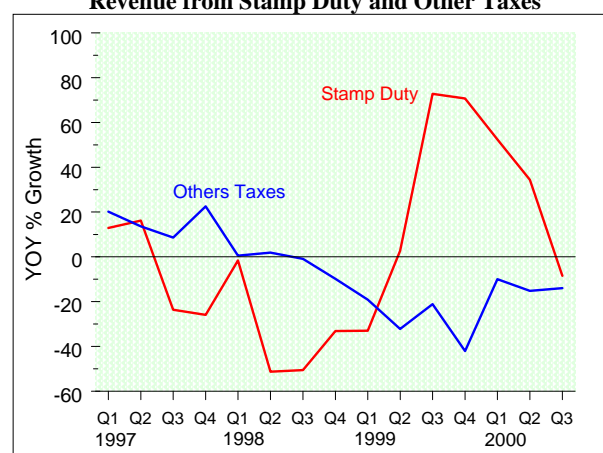


Chart 6.5  
Non-tax Revenue

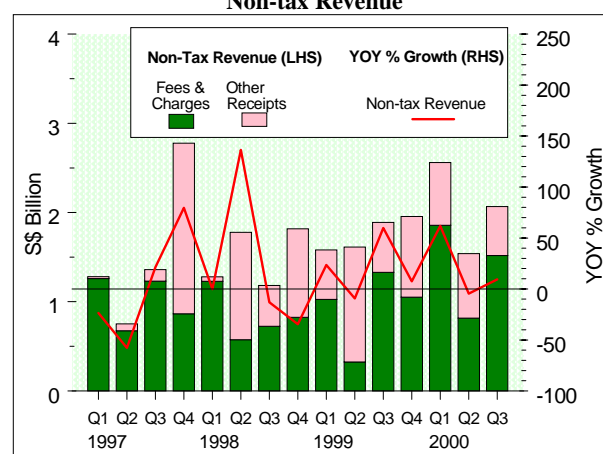
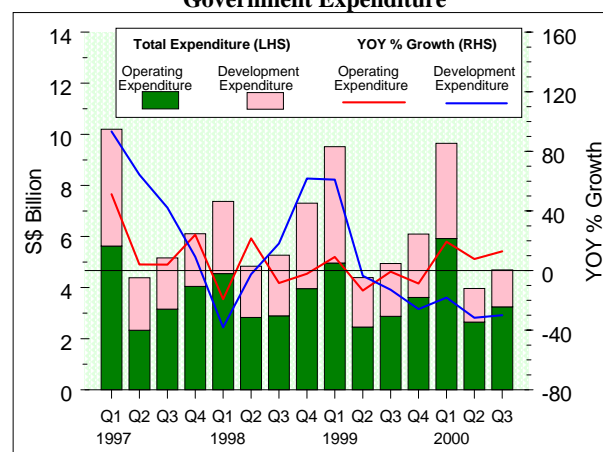


Chart 6.6  
Government Expenditure



services, which rose by 20%. Education expenditure in particular was boosted by the increase in number of teachers. Operating expenditure on healthcare was also pushed upward, in line with higher healthcare cost.

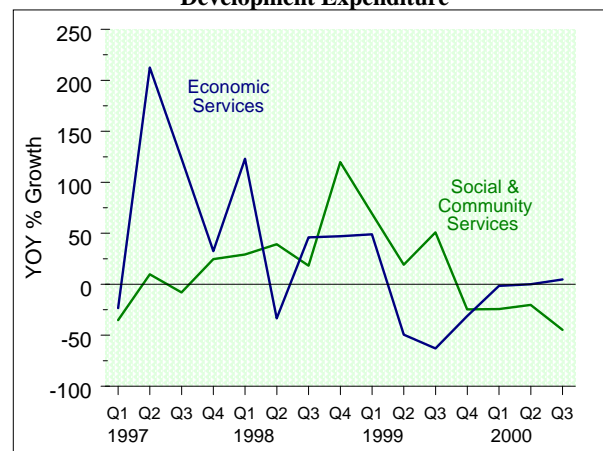
Economic services recorded further increases, albeit at a lower rate of 10%, compared to 23% in the preceding quarter. The higher spending was attributed to the trade & industry and national development categories. On the other hand, expenditure on communications contracted by 27%.

Development expenditure recorded its sixth consecutive decline year-on-year, falling by 30% to \$1.4 billion in Q3 00. This was largely due to a reduction in spending in social & community services, particularly in public housing. (Chart 6.7) Development spending on public housing fell as the building programme has slowed in line with the shorter queues for new flats. Also, fewer residential precincts were selected for the upgrading program during the economic downturn. Development spending on environment halved compared with the same period last year, as construction of the Tuas South Incinerator Plant reached completion. Nevertheless, several on-going projects, such as the sewerage programme, continued to support overall development expenditure.

Development spending on economic services grew by 4.7%. (Chart 6.7) The increase was led by spending on national development and research & development (R&D). Most of the R&D expenditure was focused on science and technology, in particular, life sciences and physical sciences. Spending on communications, however, fell substantially as most current rail projects are approaching completion.

Government expenditure is expected to increase in the next few quarters. A \$5.2 billion expenditure package was approved by Parliament recently, including the \$1.9 billion compensation to Starhub and SingTel for early termination of duopoly rights. In addition, the environment ministry is starting construction of the Changi Waste Water Treatment Plant, while HDB is also reviewing the upgrading programme for more flats to be upgraded earlier. Expenditure on economics services is projected to pick up with the construction of an underground expressway and phase four of the Jurong Island reclamation project. At the same time, the government has also directed more funds towards research & development, as well as to various arts groups.

**Chart 6.7**  
**Development Expenditure**



# 7 Balance of Payments

## 7.1 Overall Balance

Singapore's overall balance of payments surplus moderated to \$4.4 billion (10.3% of GDP) in Q3 2000, from \$5.9 billion (14.6% of GDP) in the previous quarter. (Chart 7.1)

The current and capital & financial accounts both improved, but the deficit in the balancing item expanded to \$4.9 billion. Current account surpluses have risen steadily over 2000, while capital & financial outflows have concurrently declined, thus boosting the overall surplus to \$8.1 billion in the first three quarters of the year. This compares with a surplus of \$7.3 billion in 1999 as a whole. Official foreign reserves have risen from \$128.5 billion at end-Dec 1999 to \$136 billion (or 7.4 months of imports) at end Sep 2000.

## 7.2 Current Account

The current account surplus rose to \$9.7 billion (23.0% of GDP) in Q3, from \$8.6 billion (21.3% of GDP) in Q2, on account of increases in the surpluses of the goods and services accounts. (Chart 7.2) Underpinned by robust growth of non-oil domestic exports in the quarter, the surplus in the goods account increased by \$1.8 billion to \$5.5 billion.

In the services account, the transportation and travel balances improved, with the latter contributing to most of the \$125 million increase in the overall services surplus to \$2.5 billion, as tourist arrivals into Singapore have remained strong. (Chart 7.3) At the same time, travel payments by residents declined. Both receipts and payments of transportation-related services increased in line with the buoyant trade activity.

The expansion in surpluses in the goods and services accounts in Q3 was partially offset by a smaller surplus in the income account and a larger deficit in current transfers, as compared to the previous quarter.

Chart 7.1  
Components of Balance of Payments

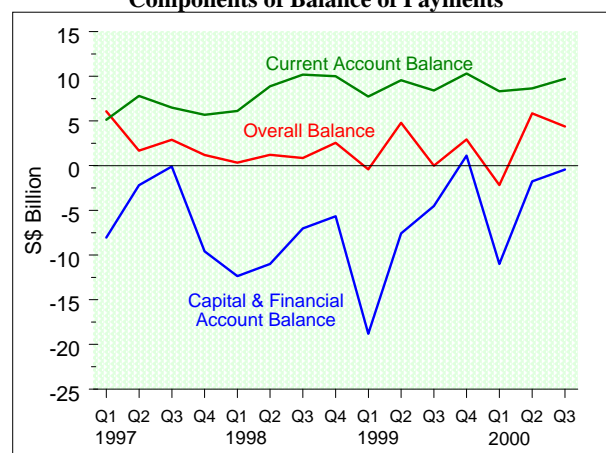


Chart 7.2  
Components of Current Account

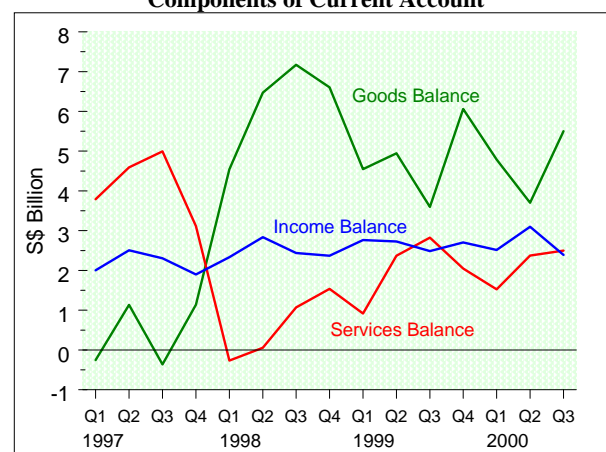
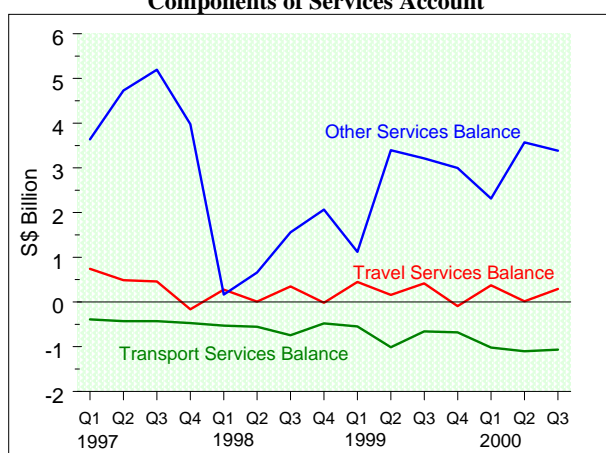


Chart 7.3  
Components of Services Account



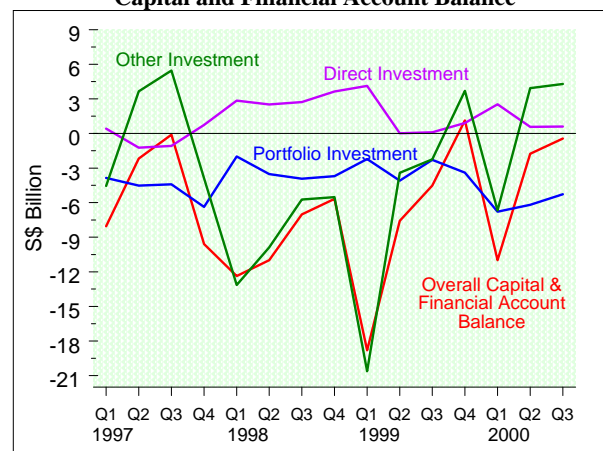
### 7.3 Capital and Financial Account

The capital and financial account registered an outflow of \$437.8 million in Q3, smaller than the \$1.8 billion outflow seen in Q2. (Chart 7.4) A moderation in net portfolio investment outflows, coupled with larger net inflows in the 'Other Investment' segment (which largely comprises bank flows) accounted for the overall smaller deficit.

Net private portfolio investment outflows declined, partly reflecting the return of funds to the Singapore equity market, in contrast to the withdrawal of funds by non-residents in the first half of the year. Together with the smaller outflow in official portfolio investment, net portfolio investment outflows fell from \$6.2 billion to \$5.3 billion in Q3. Net direct investment inflows amounted to \$600.6 million in Q3, bringing net inflows for the first three quarters to \$3.7 billion. This compares with the net inflow of investments totalling \$4.3 billion over the same period last year.

The increase in net flows in the 'Other Investment' account rose to \$4.3 billion in Q3 and was underpinned by larger net inflows of funds channelled via banks in Singapore. In the resident non-bank sector, net outflows were boosted by an increase in non-bank deposits placed with ACUs.

Chart 7.4  
Capital and Financial Account Balance



# 8 Special Feature on the MMS Model of the Singapore Economy: Simulating an Electronics Slowdown

## 8.1 Features of MMS

In this section, we illustrate the workings of the Monetary Model of Singapore (MMS) by simulating the effects of a slowdown in the electronics industry on the Singapore economy. We will also provide some details on the specification of key equations in the manufacturing sector of MMS.

As explained in a previous paper, the MMS is a fully-integrated macro-Computable General Equilibrium (CGE) model, in that it builds in all relevant interrelationships between the supply and demand sides of the economy<sup>19</sup>. There are three key features in MMS. First, MMS has a Keynesian short run; characterised by stickiness in both wages and prices, which imply that demand shocks affect economic activity. Second, financial markets are assumed to have rational or model-consistent expectations; this introduces forward-looking behaviour into the model. Third, MMS converges to a long run steady state in which, as in CGE models, producers maximise profits subject to the production technology, and markets clear.

MMS incorporates a rather detailed description of the production decisions in the economy. Five sectors are modelled: (i) manufacturing, (ii) construction, (iii) ownership of dwellings; (iv) other financial and business services; and (v) others. Each sector has its own production function, which is used to derive fully-consistent equations for employment, investment, export supply, import demand and prices. In total, MMS contains 241 equations, of which 38 are estimated and the rest, specified as identities.

## 8.2 Manufacturing Sector in MMS

To understand the effects of an electronic industry shock, it would be useful to examine the specification of several equations in the manufacturing sector of the model.

In the manufacturing sector (as in the other sectors), producers maximise profit subject to the production technology. In the short to medium run, firms are assumed to take their capital stock, export prices, import prices, domestic demand<sup>20</sup> and wages as given. Producers decide on employment, supply and sales prices, how much local inputs and imports to utilise, how much total output to produce and subsequently the proportion for the export and domestic markets. The various decisions at each step of the production process are illustrated in Figure 8.1.

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19 Please see "An Introduction to the Monetary Model of Singapore (MMS)" booklet published for the Macroeconomic Modelling and Public Policy Conference, 2 Feb 2000. It is available on the MMS website ([www.mas.gov.sg](http://www.mas.gov.sg)).

20 In the short-run, the Keynesian assumption that domestic sales are demand determined is more plausible than the classical assumption whereby domestic sales are chosen by firms. This is taken into account by assuming that domestic sales are demand-determined in the short-run, but that firms choose the price or marginal cost of domestic sales to meet this demand and maximise profits.

This profit maximising problem results in a set of non-linear first order conditions/equations in the choice of the employment, output, exports, imports and price variables as a function of the capital stock, wages, domestic sales, export and import prices. These first order conditions are then inserted directly into the model to be solved numerically.

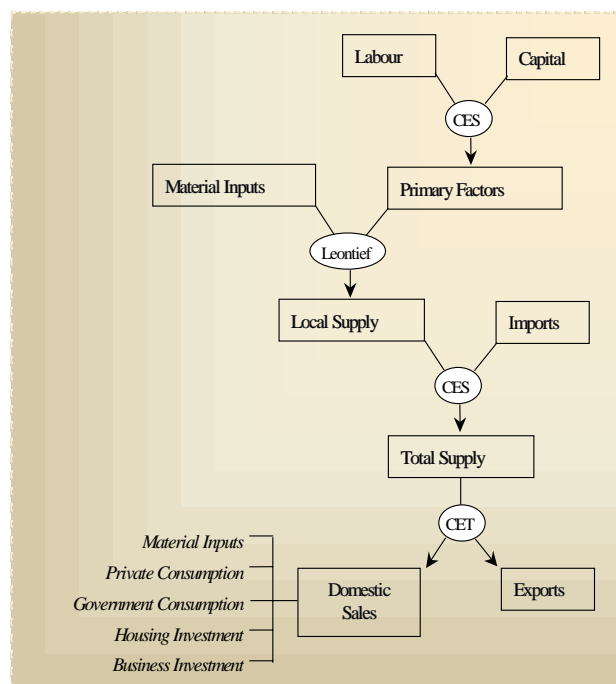
To do this, the various parameters of the production function have to be estimated. First, the values for the elasticities of substitution/transformation governing the various economic choices portrayed in Figure 1 are calibrated. They include the elasticities of substitution/transformation for capital and labour in producing primary factors; imports and production in producing total supplies and the allocation of total supplies between exports and domestic sales. The selection of the values for these elasticities is guided by the consequences for the statistical fit of equations and the model's simulation properties. For example, in the manufacturing sector, the elasticity of substitution between capital and labour is set to 0.88, while the elasticity of substitution between imports and local production is set to 1.25.

Second, the scale parameters of the various first order conditions are obtained by calibration methods using the assumed elasticities above, together with historical shares for ratios such as imports and exports in total supplies, as well as labour and capital in value added.

Third, the sustainable growth rate in real output,  $\log$  (GR) which defines the supply-side path of real variables in the long run, is calculated as the sum of growth in the labour force plus growth in labour productivity. Estimates for the long-run growth in labour force and productivity were discussed in Box Item 1: Estimates of Singapore's Long Term Economic Growth.

MMS does not assume that firms are always in short-run equilibrium. Rather, it allows for dynamic adjustment of exports, imports, employment and domestic sales prices in each sector towards equilibrium. These adjustments take place in the behavioural equations through an error correction/partial adjustment framework. We highlight below two such behavioural equations in the manufacturing sector.

**Figure 8.1: Production Structure in the Manufacturing Sector**



Note: CET refers to Constant Elasticity of Transformation production function.  
CES refers to Constant Elasticity of Substitution production function.

## 8.3 Some Key Equations in the Manufacturing Sector

### 8.31 Manufacturing Exports Supply Equation

Actual manufacturing export supply adjusts to equilibrium export supply in a simple partial adjustment model. Quantity exported is supply determined while foreign demand determines the equilibrium price level. The estimated equation is given below.

$$[\log(\text{SEXC}) - \log(\text{GR} * \text{SEXC}(-1))] =$$

$$0.0131 + \frac{0.2079 * (\log(\text{GR} * \text{SEXSRC}(-1)) - \log(\text{GR} * \text{SEXC}(-1)))}{(0.0155)^{21} (0.0937)} + \frac{2.0228 * (\log(\text{GDPF}/\text{GDPF}(-1)) - (1.0673))}{(1.0673)}$$

$$\log(\text{GR}) + \frac{0.4701 * \log(\text{RBB}(-1))}{(0.2666)} + \text{DUMMIES} + \text{TIME TREND}$$

which gives

$$\log(\text{SEXC}) = 0.0131 + 0.2079 * \log(\text{GR} * \text{SEXSRC}(-1)) + (1 - 0.2079) * \log(\text{GR} * \text{SEXC}(-1)) + 2.0228 * (\log(\text{GDPF}/\text{GDPF}(-1)) - \log(\text{GR})) + 0.4701 * \log(\text{RBB}(-1)) + \text{DUMMIES} + \text{TIME TREND}$$

Sample Period: Q2 1986 to Q3 2000

R-squared = 0.982

SE of regression = 0.0496

Durbin-Watson stat. = 2.06

ACF (1-5) = 9.46 (0.22)<sup>22</sup>

JB Normality test:  $\chi^2(2) = 0.33$  (0.13)

where

SEXC	Exports of goods produced in the manufacturing sector <sup>23</sup>
SEXSRC	Equilibrium exports of goods produced in the manufacturing sector
GR	Long-run sustainable natural growth factor of the economy
GDPF	Foreign real GDP (weighted based on share in Singapore's Non-Oil Domestic Exports)
RBB	US Book to Bill ratio

Foreign Real GDP (GDPF) serves as a general measure of world demand for Singapore's manufacturing exports while the US Book to Bill Ratio (RBB) is used as a proxy for electronics demand in the US.

These two terms pick up the short-term effect of the world economic cycle on the volume of manufacturing exports and allow manufacturing exports to respond directly to changes in global demand. If these two terms are excluded, world demand for Singapore's exports would only affect SEXC with a lag through the profit maximising decisions of producers, eg. a change in the price of exports (PEX) will affect production decisions and subsequently SEXC. Note that these terms are specified such that they fall off the specification in the equilibrium. For example, GDPF is assumed to grow at the same rate as GR in the long-run and thus the term  $[\log(\text{GDPF}/\text{GDPF}(-1)) - \log(\text{GR})]$  collapses in equilibrium.

<sup>21</sup> Figures in parenthesis indicate the standard errors of the estimated coefficients.

<sup>22</sup> Figures in parenthesis are p-values.

<sup>23</sup> Since the non-oil domestic exports (NODX) component of manufacturing exports is a key 'headline' number, we have also specified a separate equation for NODX that runs off the SEXC equation.

### Econometric Results/Issues:

As explained, the specification for SEXSRC is a function of wages (W), price of exports and imports (PEX, PIM), domestic sales (SXC) and capital stock (SKC) in the manufacturing sector. To give a flavour of the sensitivity of SEXSRC to its first order condition determinants, Table 8.1 summarises the elasticities of SEXSRC. These elasticities of the equilibrium output variables from the profit maximising decisions of producers can be thought of as making up the economic content of the modelling of production in the manufacturing sector. These short-run equilibrium elasticities are determined through numerical simulation of the first-order conditions.

**Table 8.1: Short-Run Equilibrium Elasticities for Equilibrium Exports**

	Export Price	Import Price	Wages	Price of intermediate inputs	Domestic Sales	Capital Stock
SEXSRC	1.15	-0.63	-0.09	-0.42	0.87	0.13

Some main points of these results are as follows:

The own-price effect has the expected sign with higher export prices leading to higher export supply; the export supply equation is homogenous of degree zero in prices and homogenous of degree one in domestic sales and capital stock.

In the long run,  $SEXC = SEXSRC$ , thus with the constraint on the coefficient of  $\log(\text{GR} * SEXC(-1))$ , we get

$$SEXC = \text{GR} * SEXC(-1)$$

Hence, in the long run equilibrium, the supply of exported goods produced in the manufacturing sector increases in line with the long run natural growth rate of the economy.

### 8.32 Manufacturing Employment Equation

Employment in the manufacturing sector adjusts to equilibrium employment in a partial adjustment model given below:

$$\begin{aligned} \log(\text{SNC}) - \log(\exp(\text{POPGR}) * \text{SNC}(-1)) &= -0.0016 + 0.0580 * (\log(\text{SNSRC}) - \\ &\quad (0.0031) \quad (0.0150) \\ \log(\exp(\text{POPGR}) * \text{SNC}(-1)) &- 0.1310 * \log(\text{SPXSRC}/\text{SPXC}) + \text{DUMMIES} + \text{TIME TREND} \\ &\quad (0.0597) \end{aligned}$$

which gives

$$\begin{aligned} \log(\text{SNC}) &= -0.0016 + 0.0580 * (\log(\text{SNSRC})) + \\ &(1 - 0.0580) * \log(\exp(\text{POPGR}) * \text{SNC}(-1)) - 0.1310 * \log(\text{SPXSRC}/\text{SPXC}) + \text{DUMMIES} + \text{TIME TREND} \end{aligned}$$

Sample Period: Q2 1984 to Q3 2000

R-squared = 0.987

SE of regression = 0.0114

Durbin-Watson stat. = 0.48

ACF (1-5) = 39.38 (0.00)

JB Normality test:  $\chi^2(2) = 4.11$  (0.13)

where

SNC	Total employment in manufacturing sector
SNSRC	Equilibrium total employment in manufacturing sector
POPGR	Smoothed working age population growth rate – proportionate rate per quarter
SPXSRC	Equilibrium price of local sales of manufacturing sector
SPXC	Price of local sales of manufacturing sector

In the above equation, total employment (SNC) is measured in local-equivalent units. This is calculated by taking a productivity weighted average of foreign workers (SNFC) and employment of locals (SNLC). In the current version of the model, employment of foreign workers in each sector is exogenous.

### Econometric Results/Issues:

Short run dynamic adjustments in employment decisions take place via the ratio of marginal cost of production to output price. When there is upward pressure on wages, marginal cost of production (SPXSRC) will increase, resulting in a reduction in employment due to the negative coefficient on the  $\log(\text{SPXSRC}/\text{SPXC})$  term. In the long run, SPXSRC is the marginal cost of output or production as marginal cost of output is equated with the equilibrium price of output (SPXSRC).

In the long run,  $\text{SNC} = \text{SNSRC}$ , thus with the constrain on the coefficient of  $\log(\exp(\text{POPGR}) * \text{SNC}(-1))$ , we get

$$\text{SNC} = \exp(\text{POPGR}) * \text{SNC}(-1)$$

Hence, in the long run equilibrium, total employment in the manufacturing industry grows at the same rate as the working age population growth rate.

Table 8.2 summarises the elasticities of SNSRC with respect to wages (W), price of exports and imports (PEX, PIM) and domestic sales (SXC) in the manufacturing sector. Note that the own-price effect has the expected sign with higher wages leading to reduced labour demand.

**Table 8.2: Short-Run Equilibrium Elasticities for Equilibrium Employment**

	Export Price	Import Price	Wages	Price of intermediate Inputs	Domestic Sales	Capital Stock
SNSRC	1.00	0.62	-0.29	-1.31	1.80	-0.80

We can get a better feel for the dynamics and simultaneous nature of the equations in the manufacturing sector by tracing through the effects of an electronics industry shock through the model.

## 8.4 Simulating an Electronics Slowdown

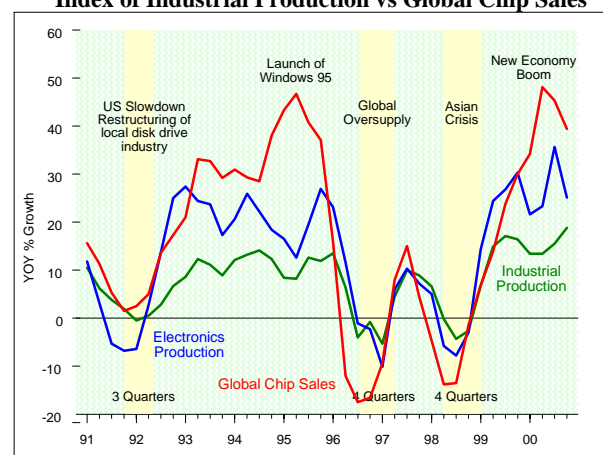
There have been recent concerns of a global electronics downturn in 2001. Given that the performance of the domestic electronics industry closely tracks global trends, such an occurrence could have a significant impact on Singapore's electronics industry. (Chart 8.1) The two previous instances of contractions in domestic electronics output over the past decade (in 1996 and 1998) were preceded by contractions in global chip sales about a quarter prior to the downturn. The downturns were either associated with a fall-off in external demand or over expansion in capacity which caused a decline in product prices. The downturns in 1991 and 1998 were precipitated by a marked decline in demand, due to a slowdown in the US economy and the Asian Crisis respectively. Restructuring in the local disk drives industry exacerbated the slowdown in the early 1990s. The slowdown in 1996, on the other hand, was essentially due to a global oversupply of semiconductors as manufacturers over-invested in anticipation of higher sales/profits in the boom years. The over capacity in the industry lingered on into 1997, before the Asian crisis dealt the industry a strong negative demand shock. The slowdown in 1996, on the other hand, was essentially due to a global oversupply of semiconductors as manufacturers over-invested in anticipation of higher sales/profits in the boom years. The over capacity in the industry lingered on into 1997, before the Asian crisis dealt the industry a strong negative demand shock.

In our analysis, we have quantified a possible risk scenario to the electronics cycle next year, similar to the electronics industry downturn experienced in 1996. As explained in Section 2.2, our baseline scenario is premised on a moderation in global electronics demand, with global chip sales<sup>24</sup> increasing by about 10-15% in 2000, from the expected 37% growth this year. Under the alternative scenario, the massive capacity build-up in 2000, coupled with unanticipated moderation of demand leads to a glut in the global semiconductors industry in early 2001. For 2001, global chip sales contract by about 7-8%. However, based on the observation that the past downturns typically last about three quarters, a rebound in electronics output and exports is expected in 1H 2002 when the global oversupply situation eases.

We introduce the electronic cycle downturn in MMS by changing the assumptions concerning the values of a number of exogenous variables: foreign export price, composite foreign GDP index and the US book-to-bill ratio. These variables appear in the manufacturing export supply equation highlighted earlier.

<sup>24</sup> Global chip sales were used as a proxy for the performance of the global electronics industry as semiconductor is the basic building block for most electronics devices. Furthermore, this series exhibit very strong correlation with our index of industrial production.

Chart 8.1  
Index of Industrial Production vs Global Chip Sales



A decline in global chip sales is introduced as a drop in foreign demand for Singapore's electronic exports, proxied by the composite foreign GDP index in the model. To create a new profile for this composite index, we estimated an out-of-model time-varying relationship to establish a link between global chip sales and composite foreign GDP. Next, foreign export prices will also need to be reduced in line with the fall in foreign GDP. Finally, we reduced the US Book to Bill Ratio quarterly profile for 2001, using a volatility-adjusted out-of-model estimation between global chip sales and book to bill ratio. Table 8.3 summarises these alternative assumptions for the exogenous variables.

**Table 8.3: Difference in Assumptions for Exogenous Variables**

Electronics Downturn Scenario	% Point Deviation	
	2001	2002
Composite Foreign GDP Growth	-0.8	-0.2
Foreign Export Price	-0.6	-0.1
US Book-to-Bill Ratio	-0.03	-0.01
Global Chip Sales Growth	-25.8	12.3

### Transmission Effects in MMS<sup>25</sup>

Our simulations show that the manufacturing sector is hit hard by the global electronics slowdown. Manufacturing output and NODX growth in 2001 are lowered by 6.2 and 4.9 percentage points respectively under this alternative scenario when compared to the baseline scenario.

Manufacturing exports are hit by the fall in export prices, which causes the price of manufacturing exports to fall below their marginal cost of production. Producers no longer find it profitable to produce the same level of exports as before. Hence, the profit maximising decisions of producers dictate a cutback in production for the export market and the equilibrium supply of manufacturing exports (SEXSRC) falls. Manufacturing export growth falls by 4.8 percentage points compared to baseline in 2001, and as a consequence, NODX also declines. (Chart 8.2). Recall that from the specification of the SEXC equation, the short run effects of the fall in export demand is also affected by the declines in foreign GDP (GDPF) and US book-to-bill ratio (RBB).<sup>26</sup>

Output in the manufacturing sector falls by about 6.2 percentage points in 2001. Producers in the sector reduce their demand for inputs including labour, causing employment growth to fall by 0.8 percentage points in 2001. Manufacturing imports also decline (2 percentage points in 2001) as less imported inputs are demanded. The weaker demand for capital services leads to a decline in the price of capital in the manufacturing sector, resulting in a drop in the actual rate of return of capital in the sector. This discourages non-residential investment growth in the manufacturing sector, which falls by 0.5 percentage points in 2001.

The decline in manufacturing growth in 2001 has negative spillover effects on the various services sectors as demand from the manufacturing sector for services rendered by these sectors falls. Thus, the various services sectors experience a slowdown in growth of about 1.1 percentage points on average in 2001. The finance and business services and other services (includes wholesale retail) sectors are most severely hit

<sup>25</sup> Note that all figures reported are in percentage point deviations of growth rates from baseline.

<sup>26</sup> There is also some fall in output for the domestic market as total production is cut back. Production for domestic sales falls in line with the manufacturing exports, albeit by a smaller amount of about 3.7 percentage points compared to baseline in 2001.

compared to construction and housing services sectors. Overall, Singapore's real GDP growth is reduced by some 2.3 percentage points in 2001, with levels about 2.1% below baseline.

In line with our assumptions that a recovery in the global electronic cycle sets in during 1H 2002, manufacturing sector GDP and overall GDP recover to register growth of about 0.8 and 1.9 percentage points above baseline respectively, for the year.

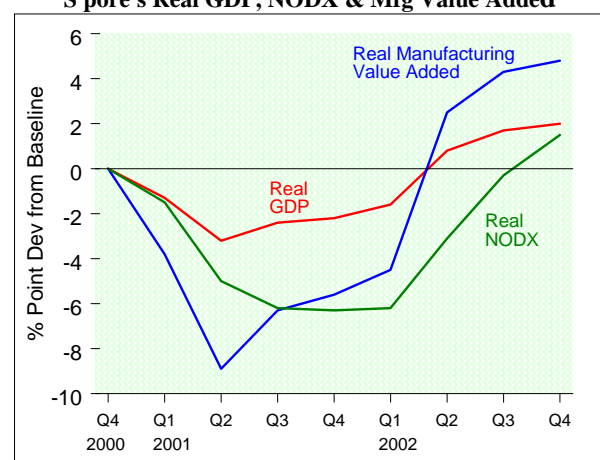
The recovery in manufacturing growth in 2002 is initially driven by domestic economic factors. In particular, the pick-up in domestic demand for manufacturing output is stimulated by the decline in local prices. The lower sales price of manufacturing output is underpinned by the lower costs of inputs that accompany the collapse in demand in earlier periods. For example, the fall in employment, particularly in the manufacturing sector raises the unemployment rate by 0.2 and 0.4 percentage points in 2001 and 2002 respectively, which in turn lowers wages in 2002, by 0.9 percentage points below baseline. This results in lower manufacturing sales prices which decline by 0.7 percentage points below baseline in 2002. This stimulates growth of domestic sales for manufacturing goods by 1 percentage point above baseline in 2002<sup>27</sup>. (Chart 8.3).

From 2H 2002 onwards, the economic recovery is also boosted by a pick-up in export sector activity. Producers in the manufacturing sector respond to the strengthening demand from the recovery in the electronics industry as reflected in an improvement in the prices of exports. Manufacturing export growth picks up and averages about 0.5 percentage points above baseline in 2H 2002.

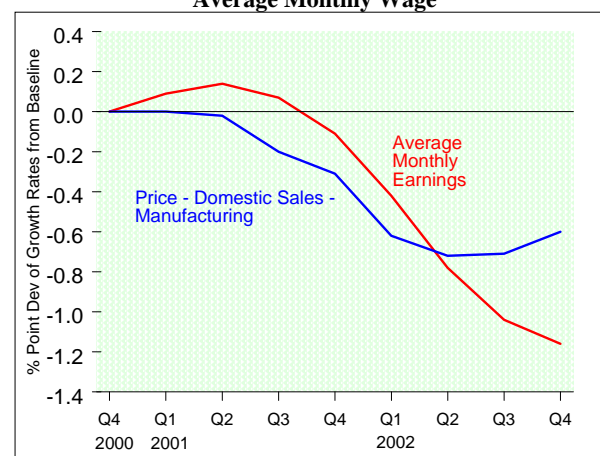
Figure 8.2 summarises the channels of transmission in MMS of a shock to the global electronics cycle just described. The first channel is the immediate short run effect on manufacturing exports via a drop in foreign GDP and US Book-to-Bill Ratio. The second channel is through the profit maximising decisions of producers in the manufacturing sector as they adjust their production and pricing decisions in response to the decline in foreign export prices. Subsequently, all other behavioural decisions relating to investment and employment respond to the ensuing changes in relative prices.

27 Note also that the lower input prices also result in substitution away from intermediate imports in the manufacturing sector as more of the relatively cheaper local inputs are utilised. Manufacturing import growth is reduced by 2.3 percentage points below baseline in 2002.

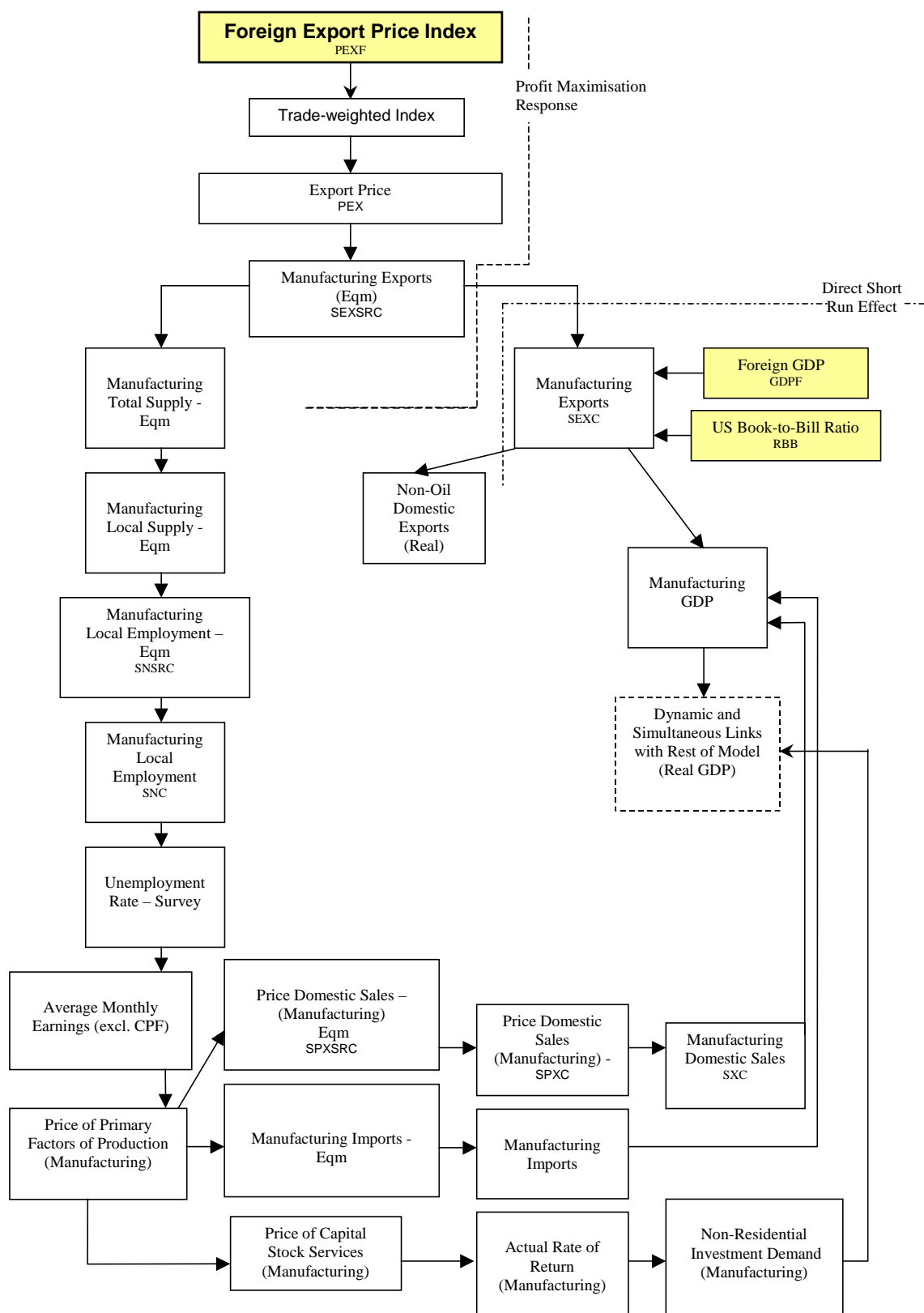
**Chart 8.2**  
**S'pore's Real GDP, NODX & Mfg Value Added**



**Chart 8.3**  
**S'pore's Mfg Domestic Sales Price & Average Monthly Wage**



**Figure 8.2: Flow-Diagram for Manufacturing Sector-Transmission Effect of Electronics Shock**



\*Exogeneous variables are in yellow boxes

Our simulation has quantified the effects of an electronic industry downturn on the Singapore economy. The estimates presented here are meant to be illustrative, only as a means to highlight some key transmission channels in the MMS. At this stage, we assign a relatively low probability to the electronic shock, modelled in this counterfactual simulation.

**Table 8.4: Definitions of Variables in MMS**

GR	Long-Run Sustainable Growth Factor Of The Economy
GDPF	Foreign Real GDP (Weighted Based On Share In Singapore's Non-Oil Domestic Exports)
PEXF	Foreign Export Price Index
PEX	Domestic Export Price Index
PIM	Domestic Import Price Index
POPGR	Smoothed Working Age Population Growth Rate-Proportionate Rate Per Quarter
RBB	US Book To Bill Ratio
SEXC	Exports Of Goods Produced In The Manufacturing Sector
SEXSRC	Equilibrium Exports Of Goods Produced In The Manufacturing Sector
SKC	Capital Stock In Manufacturing Sector
SNC	Total Employment In Manufacturing Sector
SNFC	Foreign Employment In Manufacturing Sector
SNLC	Local Employment In Manufacturing Sector
SNSRC	Equilibrium Total Employment In Manufacturing Sector
SPXSRC	Equilibrium Price Of Local Sales In Manufacturing Sector
SPXC	Price Of Local Sales Of Manufacturing Sector
SXC	Domestic Sales Of Manufacturing Sector
W	Average Quarterly Earnings (Including CPF)-Seasonally Adjusted

## Statistical Appendices

**Table 1:** Real GDP Growth by Sector

**Table 2:** Real GDP Growth by Expenditure

**Table 3:** Consumer Price Index

**Table 4:** External Trade

**Table 5:** Non-Oil Domestic Exports by Selected Countries

**Table 6:** Labour Market

**Table 7:** Monetary

**Table 8:** Fiscal

**Table 9:** Balance of Payments – Current Account

**Table 10:** Balance of Payments – Capital & Financial Accounts

**Table 11:** Exchange Rates

**TABLE 1 : REAL GDP GROWTH by sector**

Period	Total	Manu- facturing	Financial & Business Services				Con- struction	Commerce			Transport & Comm.	Total	Manu- facturing	Financial & Business Services				Con- struction	Commerce			Transport & Comm.
			Total	Financial Services	Business Services			Total	Wholesale & Retail	Hotels & Rest.				Total	Financial Services	Business Services	Total		Wholesale & Retail	Hotels & Rest.		
Year-on-Year % Change											Seasonally-adjusted Quarter-on-Quarter % Change											
1992	6.5	2.3	8.5	8.2	8.8	22.3	3.8	2.4	9.5	5.7	6.5	2.3	8.5	8.2	8.8	22.3	3.8	2.4	9.5	5.7		
1993	12.7	9.6	15.2	25.0	6.6	9.0	19.7	23.2	6.0	10.6	12.7	9.6	15.2	25.0	6.6	9.0	19.7	23.2	6.0	10.6		
1994	11.4	12.8	11.6	11.7	11.5	16.6	12.1	13.7	5.0	10.1	11.4	12.8	11.6	11.7	11.5	16.6	12.1	13.7	5.0	10.1		
1995	8.0	10.0	5.3	2.8	7.9	8.8	8.8	9.6	4.9	10.6	8.0	10.0	5.3	2.8	7.9	8.8	8.8	9.6	4.9	10.6		
1996	7.5	2.9	8.4	7.3	9.4	22.0	6.1	6.1	6.0	8.5	7.5	2.9	8.4	7.3	9.4	22.0	6.1	6.1	6.0	8.5		
1997	8.4	4.5	13.0	18.3	7.9	15.3	6.4	6.4	6.5	9.1	8.4	4.5	13.0	18.3	7.9	15.3	6.4	6.4	6.5	9.1		
1998	0.4	-0.6	-1.7	-8.1	5.1	4.4	-4.0	-4.1	-3.5	5.5	0.4	-0.6	-1.7	-8.1	5.1	4.4	-4.0	-4.1	-3.5	5.5		
1999	5.4	13.8	0.0	0.0	0.1	-11.8	6.5	7.1	3.7	7.1	5.4	13.8	0.0	0.0	0.1	-11.8	6.5	7.1	3.7	7.1		
1997 Q1	5.2	-5.2	14.1	21.4	7.0	10.2	3.4	2.7	6.6	8.5	7.2	-3.4	27.0	49.1	7.5	5.4	4.0	2.2	13.9	9.5		
Q2	9.2	4.4	14.6	23.2	6.3	13.0	8.4	8.5	8.0	9.5	14.8	20.4	11.2	15.0	7.1	28.6	15.0	17.2	4.2	10.4		
Q3	11.3	9.8	14.4	19.6	9.3	19.8	10.6	11.1	8.2	10.4	8.0	15.3	3.0	-5.6	13.2	29.2	2.2	2.7	0.2	7.0		
Q4	7.8	8.6	9.1	9.4	8.9	17.4	3.8	3.9	3.2	8.1	1.7	3.1	-2.6	-11.4	7.4	9.7	-5.7	-5.7	-5.6	6.2		
1998 Q1	4.7	6.4	-0.4	-8.0	7.9	18.0	0.9	1.9	-3.8	7.3	-4.0	-10.3	-11.3	-25.2	4.5	6.4	-5.3	-3.9	-12.4	5.7		
Q2	0.4	-0.3	-3.5	-13.1	7.1	10.0	-4.6	-4.9	-3.1	6.0	-4.1	-8.0	-2.9	-9.8	3.8	-3.7	-10.0	-12.7	5.4	4.1		
Q3	-1.9	-4.3	-4.2	-11.8	4.0	0.5	-6.0	-6.1	-5.3	4.0	-0.9	-0.7	0.9	1.9	0.1	-9.8	-2.5	-1.7	-6.8	0.8		
Q4	-1.2	-2.9	1.6	1.7	1.6	-7.8	-6.2	-7.1	-1.9	4.8	4.6	8.4	22.5	54.9	-1.8	-21.2	-7.1	-9.6	6.7	9.1		
1999 Q1	0.8	6.7	-3.7	-7.6	0.0	-8.3	-2.2	-2.3	-1.5	5.6	3.9	31.2	-28.2	-48.8	-1.8	3.0	13.0	18.1	-9.6	8.6		
Q2	6.6	14.8	4.6	10.3	-0.6	-12.2	6.3	6.6	4.4	6.6	19.0	22.9	34.7	83.6	1.4	-19.0	24.3	23.0	31.8	7.6		
Q3	6.9	16.9	1.8	3.6	0.2	-14.2	8.7	9.4	5.5	7.7	1.1	6.8	-9.2	-20.4	3.0	-18.2	7.2	9.0	-2.1	5.9		
Q4	7.1	16.1	-2.6	-6.2	0.8	-12.2	13.3	14.7	6.2	8.4	4.7	5.6	1.7	2.9	0.6	-12.3	9.2	9.3	8.6	11.6		
2000 Q1	10.1	13.3	8.3	12.4	4.9	-9.0	16.1	17.2	10.4	9.8	16.7	19.0	10.7	5.9	15.3	17.8	25.4	29.2	6.2	14.3		
Q2	9.0	13.3	2.7	-1.0	6.4	-1.7	13.9	15.2	7.4	9.5	14.2	22.7	9.1	10.9	7.5	10.5	14.6	14.1	17.4	6.3		
Q3	10.4	15.5	6.1	4.4	7.7	-1.3	14.2	15.2	9.0	9.2	6.6	15.6	3.1	-1.7	7.7	-17.0	8.6	9.3	4.6	5.1		

Source: Singapore Department of Statistics

**TABLE 2 : REAL GDP GROWTH by expenditure**

Year-on-Year % Change

Period	Total Demand	Domestic Demand							External Demand
		Total	Consumption			Gross Fixed Capital Formation			
			Total	Private	Public	Total	Private	Public	
1992	7.0	6.8	4.8	5.8	0.4	11.8	14.5	1.9	7.1
1993	16.3	14.4	12.4	11.9	14.7	10.3	10.9	7.6	17.2
1994	15.3	4.0	5.8	7.5	-1.7	9.6	6.5	22.8	20.5
1995	12.6	9.2	5.3	4.0	11.7	11.8	14.6	1.7	14.0
1996	8.7	12.1	8.8	6.5	19.3	22.8	27.0	5.2	7.4
1997	7.6	10.2	6.4	6.2	7.1	10.6	8.1	22.9	6.6
1998	-5.3	-7.3	-0.2	-2.1	7.7	-6.7	-9.9	7.2	-4.4
1999	6.6	6.5	5.6	6.2	3.3	-3.6	-4.7	0.2	6.7
1997 Q1	1.8	4.6	6.1	6.4	5.4	4.7	3.7	9.0	0.7
Q2	8.7	7.3	8.8	7.2	17.8	3.0	-2.2	33.6	9.2
Q3	12.5	19.4	5.2	8.5	-7.4	28.0	26.9	32.7	10.0
Q4	7.5	10.0	5.7	3.0	19.1	8.1	6.1	18.1	6.5
1998 Q1	4.2	6.8	3.7	2.0	9.1	13.5	13.0	15.4	3.1
Q2	-5.8	-5.3	0.8	-0.9	9.8	-3.9	-6.8	8.4	-6.0
Q3	-8.4	-13.5	-4.6	-5.9	1.4	-12.3	-14.8	-2.0	-6.3
Q4	-10.1	-16.2	-0.8	-3.4	10.3	-20.0	-26.3	8.8	-7.6
1999 Q1	-4.8	-7.5	4.3	0.1	16.2	-17.5	-25.3	15.4	-3.5
Q2	6.7	6.8	5.1	7.0	-3.9	-2.3	-2.2	-2.6	6.7
Q3	9.4	15.4	7.8	9.8	-0.7	3.6	5.1	-1.9	7.2
Q4	15.6	13.7	5.3	8.0	-5.2	3.4	7.5	-9.3	16.3
2000 Q1	14.0	9.9	7.3	9.2	2.7	4.8	10.8	-11.6	15.8
Q2	11.9	10.6	8.7	9.1	6.6	2.8	5.0	-5.2	12.4
Q3	14.1	1.7	7.5	8.8	1.8	4.8	8.1	-8.2	19.0

Source: Singapore Department of Statistics

**TABLE 3 : CONSUMER PRICE INDEX**

Period	All Items	Food	Housing	Clothing	Transport & Comms.	Education & Stationery	Health	Misc- ellaneous	All Items	Food	Housing	Clothing	Transport & Comms.	Education & Stationery	Health	Misc- ellaneous
1992	90.1	89.6	90.5	95.2	90.8	84.1	83.4	90.8	2.3	1.3	2.0	2.2	2.9	4.7	2.9	3.2
1993	92.2	90.4	93.5	96.3	93.2	86.9	86.5	94.6	2.3	0.8	3.2	1.2	2.6	3.3	3.7	4.1
1994	95.1	93.6	94.7	98.5	99.5	89.1	89.2	96.2	3.1	3.6	1.3	2.2	6.7	2.5	3.1	1.7
1995	96.7	95.7	95.4	99.9	100.1	92.8	90.7	98.6	1.7	2.3	0.7	1.5	0.6	4.2	1.6	2.5
1996	98.0	97.7	95.9	100.4	100.4	95.6	92.7	100.4	1.4	2.1	0.5	0.5	0.4	3.0	2.3	1.8
1997	100.0	99.7	98.1	101.1	104.3	97.1	96.1	100.6	2.0	2.0	2.3	0.7	3.9	1.5	3.7	0.2
1998	99.7	99.9	99.9	99.8	99.2	100.1	100.2	99.5	-0.3	0.2	1.9	-1.3	-4.9	3.1	4.3	-1.1
1999	99.8	100.8	98.6	97.9	98.7	101.6	100.8	100.3	0.0	0.9	-1.4	-1.9	-0.6	1.5	0.6	0.8
1997 Q1	99.1	99.5	96.6	101.5	101.6	96.5	93.8	100.8	1.7	2.8	1.0	0.7	1.7	1.6	2.1	0.8
Q2	99.6	99.4	97.2	100.9	103.9	96.5	95.5	100.9	1.8	2.0	1.5	-0.3	3.6	1.6	3.3	0.5
Q3	100.5	100.0	98.7	100.7	106.4	97.6	96.6	100.0	2.3	1.7	2.9	1.0	5.8	1.4	3.9	-0.5
Q4	100.8	100.0	99.8	101.4	105.5	97.7	98.6	100.7	2.3	1.5	3.7	1.3	4.4	1.5	5.3	-0.2
1998 Q1	100.2	100.3	100.4	100.3	100.1	99.5	100.0	100.5	1.1	0.8	3.9	-1.2	-1.5	3.2	6.6	-0.2
Q2	99.7	100.0	99.7	99.9	99.8	99.7	100.1	99.2	0.1	0.6	2.6	-1.0	-3.9	3.3	4.8	-1.6
Q3	99.6	99.8	100.0	99.4	99.2	100.9	100.4	98.6	-0.9	-0.2	1.3	-1.3	-6.8	3.4	3.9	-1.4
Q4	99.4	99.7	99.7	99.5	97.9	100.2	100.6	99.6	-1.4	-0.3	-0.1	-1.8	-7.2	2.5	2.0	-1.1
1999 Q1	99.5	100.3	99.1	99.4	97.2	101.7	100.9	100.1	-0.7	0.0	-1.3	-0.8	-2.9	2.2	1.0	-0.4
Q2	99.7	101.0	98.4	98.2	98.2	101.6	100.6	100.6	0.0	1.0	-1.3	-1.7	-1.6	1.9	0.5	1.4
Q3	99.9	101.1	98.5	97.6	99.3	101.7	100.8	100.2	0.3	1.3	-1.4	-1.7	0.1	0.8	0.5	1.6
Q4	99.9	101.0	98.2	96.3	100.0	101.4	101.0	100.5	0.5	1.3	-1.4	-3.3	2.2	1.2	0.4	0.8
2000 Q1	100.6	102.1	99.2	96.7	100.4	101.7	101.1	101.0	1.1	1.8	0.1	-2.7	3.4	0.0	0.2	0.9
Q2	100.5	101.3	99.5	95.8	100.1	102.4	101.7	101.4	0.8	0.3	1.1	-2.4	1.9	0.8	1.2	0.9
Q3	101.4	101.1	101.4	97.5	101.3	103.8	102.6	101.7	1.5	0.0	2.9	-0.2	2.0	2.0	1.8	1.5

Source: Singapore Department of Statistics

**TABLE 4 : EXTERNAL TRADE**

Period	Total Trade	Exports	Domestic Exports						Re-exports	Imports	Exports	Domestic Exports			Re-exports	Imports	Year-on-Year % Change			
			Total	Oil	Non-oil		Total	Oil				Non-oil	Total	Oil			Non-oil	Re-exports	Imports	Year-on-Year % Change
					Total	Electronics														
			At Current Prices										At 1995 Prices							
1992	2.2	1.4	0.5	-22.1	8.4	11.9	3.3	3.3	2.9	7.6	8.9	-11.0	14.6	5.5	6.5					
1993	16.4	15.6	13.7	8.6	14.9	21.4	4.9	19.1	17.1	17.2	16.1	15.6	16.3	18.9	18.9					
1994	18.1	23.3	17.4	-3.9	22.5	30.3	8.4	33.4	13.7	27.6	24.0	11.0	26.8	33.5	14.7					
1995	13.2	13.7	11.2	-1.9	13.7	16.3	8.1	17.4	12.7	16.5	14.9	-0.1	17.7	18.8	14.0					
1996	5.1	5.2	5.2	20.6	2.7	4.3	-1.0	5.3	5.0	10.1	9.3	3.6	10.3	11.1	9.5					
1997	5.7	5.3	3.8	-3.9	5.3	3.4	9.8	7.4	6.2	11.6	11.2	0.1	12.9	12.2	10.2					
1998	-7.5	-1.0	-1.5	-15.3	0.9	-0.5	4.2	-0.3	-13.6	-0.3	0.7	8.5	-0.4	-1.6	-12.9					
1999	8.1	5.7	9.8	12.4	9.5	6.1	16.8	0.2	10.8	5.4	8.1	-9.3	10.6	1.6	9.5					
1997 Q1	-2.5	-2.8	-4.1	-4.3	-4.1	-6.7	2.7	-0.8	-2.2	4.5	3.6	-8.3	5.6	5.9	2.6					
Q2	5.3	5.9	3.8	1.0	4.4	4.2	4.9	9.1	4.6	14.3	13.3	3.7	14.9	15.8	10.1					
Q3	11.7	8.7	7.5	-2.5	9.3	8.0	12.5	10.3	14.6	15.6	16.1	3.7	17.9	15.1	19.4					
Q4	8.4	9.1	7.9	-9.6	11.2	8.2	18.5	10.8	7.7	11.7	11.6	1.5	12.9	11.8	9.1					
1998 Q1	4.1	9.7	6.7	-14.1	10.7	8.5	15.9	14.0	-1.1	9.3	7.7	11.5	7.2	11.4	-0.7					
Q2	-7.7	-1.3	-3.3	-19.5	-0.2	-2.1	4.3	1.4	-13.8	-0.9	-1.2	-2.2	-1.0	-0.5	-13.8					
Q3	-9.3	-1.1	-0.9	-15.4	1.4	-0.6	6.0	-1.3	-16.9	-2.3	-1.4	4.2	-2.1	-3.5	-17.4					
Q4	-15.5	-9.7	-7.4	-11.8	-6.7	-6.6	-7.0	-12.8	-21.0	-5.8	-1.5	22.9	-4.3	-11.8	-18.0					
1999 Q1	-9.4	-9.0	-3.8	-7.9	-3.2	-4.8	0.2	-15.7	-9.9	-5.5	0.6	3.5	0.2	-13.7	-7.2					
Q2	8.0	5.2	9.8	6.9	10.3	5.4	21.1	-1.0	11.1	4.6	8.2	-2.0	9.7	-0.4	9.8					
Q3	10.3	5.2	9.6	13.7	9.0	5.1	17.3	-0.6	16.0	5.1	7.4	-20.0	11.2	1.9	15.0					
Q4	24.6	21.9	23.6	37.8	21.5	18.4	28.5	19.6	27.4	17.2	15.6	-18.5	20.7	19.8	21.2					
2000 Q1	23.7	22.8	19.4	53.5	14.5	9.8	24.2	27.9	24.6	17.1	10.2	-21.0	15.0	27.9	16.8					
Q2	20.7	18.7	13.4	42.6	9.1	2.8	21.1	26.5	22.9	12.8	6.3	-14.8	9.2	22.7	13.2					
Q3	26.8	28.4	22.9	59.6	17.8	15.7	21.8	36.6	25.1	21.9	16.2	4.9	17.4	30.3	15.9					

Source: Singapore Trade Development Board

**TABLE 5 : NON-OIL DOMESTIC EXPORTS by selected countries**

Period	All Countries	ASEAN				NIEs				USA	Japan	EU 15	Others
		Total	of which:			Total	Hong Kong	S. Korea	Taiwan				
			Malaysia	Thailand	Philippines								
Year-on-Year % Change													
1995	13.7	7.7	1.7	24.2	23.8	14.8	7.8	30.3	19.5	11.9	36.1	14.1	12.2
1996	2.7	0.1	-3.4	-0.5	21.2	-1.2	-4.8	16.6	-5.8	5.8	5.1	2.4	2.6
1997	5.3	6.5	4.9	1.3	40.1	9.2	9.7	-1.7	16.6	4.6	-15.3	12.0	7.1
1998	0.9	-9.6	-9.7	-9.1	-10.2	-10.4	-9.3	-22.2	-4.6	3.1	-8.7	11.1	16.3
1999	9.5	11.7	12.4	18.5	11.4	20.2	2.2	50.3	32.3	2.2	27.7	7.0	7.6
1997 Q1	-4.1	3.3	2.7	-4.7	31.5	-7.8	-8.9	1.0	-11.8	-10.6	-21.6	4.9	6.6
Q2	4.4	8.3	9.2	2.8	30.5	7.6	11.1	-10.9	16.9	3.2	-20.4	11.3	9.1
Q3	9.3	9.0	4.5	11.8	46.0	18.9	20.0	1.7	31.1	10.7	-8.0	12.6	4.6
Q4	11.2	5.4	3.4	-4.2	50.2	19.1	16.8	2.7	35.1	14.8	-10.0	18.4	8.2
1998 Q1	10.7	-1.3	-6.1	4.6	22.1	7.1	11.8	-26.9	24.9	18.0	3.8	12.7	21.2
Q2	-0.2	-14.7	-17.0	-8.3	-17.9	-10.9	-3.0	-25.0	-15.4	6.2	-13.0	10.8	15.3
Q3	1.4	-7.8	-3.2	-17.5	-14.4	-13.7	-14.2	-25.4	-5.5	-0.8	-12.5	19.9	21.4
Q4	-6.7	-13.9	-12.1	-14.4	-22.0	-20.8	-27.3	-11.9	-16.0	-7.3	-12.4	3.1	8.5
1999 Q1	-3.2	-8.6	-7.1	-5.7	-14.3	-7.6	-21.3	43.3	-10.0	-6.8	-0.9	6.4	0.1
Q2	10.3	9.9	12.5	11.4	15.3	12.2	-14.8	50.2	44.6	2.3	38.9	10.2	13.0
Q3	9.0	10.4	6.0	31.0	14.8	25.7	12.0	44.8	37.5	3.2	27.3	6.3	1.9
Q4	21.5	35.8	38.3	43.0	32.1	52.8	41.7	60.3	62.7	9.9	48.4	5.6	15.4
2000 Q1	14.5	26.6	29.0	17.0	41.5	54.6	44.7	60.5	62.8	4.5	33.6	-9.3	14.7
Q2	9.1	17.5	15.7	21.5	20.5	46.4	27.7	53.2	64.3	-4.7	14.2	-11.6	21.3
Q3	17.8	25.6	34.4	12.1	6.7	44.6	16.1	53.1	76.6	6.9	40.1	-3.4	25.9
% Share of All Countries													
1995	100.0	20.4	13.7	4.2	1.3	13.0	6.7	2.4	3.9	28.4	9.2	18.2	10.8
1996	100.0	19.9	12.9	4.0	1.6	12.5	6.2	2.7	3.6	29.2	9.5	18.2	10.8
1997	100.0	20.1	12.8	3.9	2.1	13.0	6.5	2.5	4.0	29.0	7.6	19.3	10.9
1998	100.0	18.0	11.5	3.5	1.9	11.5	5.8	2.0	3.7	29.7	6.9	21.3	12.6
1999	100.0	18.4	11.8	3.8	1.9	12.7	5.4	2.7	4.5	27.7	8.0	20.8	12.4

Source: Singapore Trade Development Board

**TABLE 6 : LABOUR MARKET**

Period	Average Monthly Earnings	Labour Productivity								Unit Labour Cost		Changes in Employment							
		All Sectors	Manu- facturing	Con- struction	Wholesale & Retail Trade	Hotels & Rest- aurants	Transport & Comms.	Financial Services	Business Services	Overall Economy	Manu- facturing	All Sectors	Manu- facturing	Con- struction	Wholesale & Retail Trade	Hotels & Rest- aurants	Transport & Comms.	Financial Services	Business Services
Year-on-Year % Change												Thousand							
1992	7.5	3.2	2.8	14.5	-0.8	6.0	1.7	4.8	3.2	3.5	6.6	40.3	-7.9	11.3	8.1	1.0	6.2	1.8	6.5
1993	6.3	9.2	11.6	-4.9	18.6	6.4	6.1	18.7	1.6	-0.9	-2.5	70.8	-3.1	26.4	12.3	2.6	4.8	4.8	7.3
1994	8.8	6.6	11.3	5.0	10.0	0.8	8.1	3.2	4.3	2.3	-3.2	72.1	11.6	13.1	8.6	4.8	2.6	5.1	10.9
1995	6.4	2.8	6.5	-3.5	6.2	3.5	6.1	-4.0	-0.9	2.8	-1.5	109.0	12.5	40.6	11.4	2.7	9.3	4.8	13.2
1996	5.8	1.2	2.9	-2.9	3.2	2.9	3.8	1.2	0.2	2.5	2.2	102.6	-7.7	52.8	5.7	3.2	6.2	5.4	13.0
1997	5.7	2.2	5.5	-4.0	3.9	1.9	4.9	9.0	-0.8	0.8	0.8	120.3	3.7	45.8	7.5	5.2	6.2	8.1	18.0
1998	2.8	-2.3	1.4	-2.9	-3.3	-5.1	3.7	-10.4	-2.7	2.5	-1.4	-23.4	-27.6	-4.7	-11.9	-1.6	-0.5	-2.0	8.5
1999	2.7	5.8	17.7	-5.4	8.8	3.5	6.3	-1.1	-5.9	-10.2	-18.1	39.9	4.4	-18.0	3.4	1.4	4.5	4.7	17.4
1997 Q1	5.1	-0.4	-3.2	-9.4	0.5	3.0	4.4	13.7	-0.6	3.4	9.3	16.2	-0.9	10.7	0.5	-2.1	0.5	1.2	1.6
Q2	6.0	3.1	6.1	-6.3	5.9	3.1	5.3	13.8	-2.0	0.1	0.3	37.2	-1.2	12.5	2.8	2.3	2.1	3.0	8.2
Q3	5.2	4.7	10.5	-0.6	8.3	3.3	6.2	9.4	0.3	-2.0	-4.3	31.1	2.4	16.2	-0.1	-1.3	2.2	1.4	3.3
Q4	6.2	1.2	7.9	-0.5	1.4	-1.7	4.0	-0.3	-1.0	1.3	-2.5	35.8	3.4	6.4	4.3	6.4	1.4	2.4	4.8
1998 Q1	4.8	-1.1	5.4	3.3	0.0	-7.4	3.7	-14.9	-3.1	3.7	-3.6	9.1	-1.0	7.1	-1.7	-3.7	-0.6	-1.0	3.3
Q2	4.3	-3.6	0.0	-1.1	-4.7	-4.6	3.5	-17.2	-0.9	5.6	1.5	-5.9	-8.0	0.9	-5.0	-0.4	0.3	0.4	0.7
Q3	2.9	-3.7	-1.5	-4.9	-4.6	-7.0	2.9	-11.6	-3.1	3.7	0.9	-20.3	-10.6	-4.1	-3.8	-0.5	-0.4	-3.8	5.3
Q4	-0.3	-0.7	2.9	-7.8	-3.9	-1.6	4.9	3.8	-3.8	-2.2	-3.5	-6.3	-7.9	-8.6	-1.3	3.0	0.2	2.3	-0.8
1999 Q1	-0.3	2.6	14.4	-4.3	1.4	0.0	6.1	-5.2	-3.7	-8.3	-15.3	-9.6	-3.3	-10.5	-0.2	-2.9	-0.2	-0.6	2.7
Q2	1.0	7.9	20.8	-5.1	8.9	4.2	6.4	11.9	-6.9	-14.5	-23.5	15.5	4.1	-3.3	0.0	0.7	1.0	1.1	7.0
Q3	3.5	7.0	19.3	-6.5	11.0	5.0	6.4	0.3	-5.9	-12.4	-20.8	7.7	2.4	-5.1	-0.8	-0.1	1.8	2.0	2.8
Q4	5.9	5.6	15.6	-6.0	13.9	5.0	6.1	-10.7	-6.8	-6.4	-13.5	26.3	1.2	0.9	4.4	3.8	2.0	2.1	4.9
2000 Q1	8.1	7.0	11.5	-5.3	14.9	7.9	6.1	4.7	-4.9	0.3	-4.6	13.7	-0.5	-2.2	3.9	-1.8	2.0	1.7	5.9
Q2	7.2	5.2	11.2	0.1	11.2	5.0	4.7	-8.8	-2.9	2.2	-4.6	29.7	6.5	2.3	4.5	0.4	2.7	2.0	6.8
Q3	8.7	5.6	11.6	-1.5	9.8	7.1	4.0	-3.8	-2.3	2.5	-3.8	30.0	11.1	1.7	2.5	-0.2	2.6	1.9	4.4

Source: Singapore Department of Statistics  
Ministry of Manpower

**TABLE 7 : MONETARY**

End of Period	Money Supply								Interest Rates				
	Narrow Money M1	Broad Money M2	Broad Money M3	Reserve Money	Narrow Money M1	Broad Money M2	Broad Money M3	Reserve Money	Prime Lending Rate	3-month Interbank Rate	3-month SIBOR (US\$)	Banks	
												Savings Rate	12-month Fixed Deposit Rate
	S\$ Billion				Year-on-Year % Change				Rate % Per Annum				
1992	18.5	75.7	101.5	13.5	12.7	8.9	9.5	10.6	5.55	2.19	3.50	1.79	2.97
1993	22.9	82.1	111.4	14.7	23.6	8.5	9.7	8.4	5.34	3.31	3.38	1.59	2.79
1994	23.4	94.0	125.8	15.6	2.3	14.4	13.0	6.2	6.49	4.38	6.50	2.93	4.23
1995	25.3	102.0	136.7	17.0	8.3	8.5	8.7	9.4	6.26	2.44	5.56	2.72	4.01
1996	27.0	112.0	148.5	18.2	6.7	9.8	8.6	6.7	6.26	3.38	5.56	2.72	3.99
1997	27.5	123.4	160.8	19.2	1.7	10.3	8.3	5.6	6.96	6.63	5.81	3.08	4.41
1998	27.2	160.8	173.6	16.6	-1.0	30.2	8.0	-13.3	5.90	1.75	5.13	1.43	2.51
1999	31.1	174.5	186.2	21.4	14.2	8.5	7.3	28.6	5.80	2.63	6.06	1.36	2.46
1997 Q1	28.5	117.0	153.8	19.4	9.8	11.8	10.9	14.2	6.26	3.50	5.75	2.72	3.99
Q2	28.2	119.1	156.3	18.3	6.9	10.6	10.0	3.7	6.26	3.63	5.81	2.72	3.98
Q3	28.0	120.5	157.8	18.6	5.5	10.2	9.5	4.8	6.26	4.00	5.75	2.72	3.98
Q4	27.5	123.4	160.8	19.2	1.7	10.3	8.3	5.6	6.96	6.63	5.81	3.08	4.41
1998 Q1	26.6	128.0	164.8	19.1	-6.5	9.4	7.1	-1.3	7.74	4.75	5.69	3.46	5.32
Q2	24.9	128.7	165.5	18.8	-11.8	8.1	5.9	2.5	7.79	6.13	5.69	3.49	5.38
Q3	24.9	132.6	169.5	15.2	-11.0	10.0	7.4	-18.3	7.54	4.31	5.31	3.24	4.94
Q4	27.2	160.8	173.6	16.6	-1.0	30.2	8.0	-13.3	5.90	1.75	5.13	1.43	2.51
1999 Q1	29.0	163.6	176.0	17.3	8.9	27.8	6.8	-9.5	5.80	2.13	5.00	1.36	2.46
Q2	29.6	167.9	179.6	16.7	18.9	30.4	8.5	-10.9	5.80	1.75	5.34	1.36	2.46
Q3	28.8	170.3	181.8	17.0	15.4	28.4	7.3	11.5	5.80	2.19	6.05	1.36	2.46
Q4	31.1	174.5	186.2	21.4	14.2	8.5	7.3	28.6	5.80	2.63	6.06	1.36	2.46
2000 Q1	32.1	172.7	184.5	17.7	10.6	5.6	4.9	2.2	5.85	2.31	6.28	1.33	2.46
Q2	33.1	171.7	183.3	17.7	11.6	2.3	2.1	5.8	5.85	2.50	6.78	1.33	2.46
Q3	31.7	166.6	178.4	17.4	10.3	-2.2	-1.9	2.5	5.85	2.50	6.81	1.33	2.46

Source: Monetary Authority of Singapore

**TABLE 8 : FISCAL**

Period	Operating Revenue							Expenditure			Surplus (+)/ Deficit (-)	
	Total	Tax Revenue				Non-tax Revenue	Total	Operating	Development			
		Total	Income Tax	Asset Tax	Stamp Duty					GST		
S\$ Million												% of GDP
FY1992	17772	14237	7147	1498	673	0	3535	12161	8512	3649	5611	6.8
FY1993	20656	16224	7735	1645	1107	0	4432	12896	9001	3895	7759	8.0
FY1994	23713	19000	8296	1845	1394	1523	4714	14043	10072	3971	9670	8.9
FY1995	25255	19896	8773	1757	1271	1626	5359	17410	11449	5962	7844	6.4
FY1996	28930	23205	10951	1824	1878	1746	5725	23288	14159	9129	5642	4.3
FY1997	29181	23011	10195	2335	1689	1927	6170	23042	14080	8962	6139	4.3
FY1998	27911	21551	11331	1529	953	1658	6360	26933	14651	12282	978	0.7
FY1999	30645	22624	11748	1314	1412	1995	8021	25079	14867	10212	5566	3.7
FY 2000 (Estimated)	31449	23248	11261	1783	1600	1900	8201	28995	16094	12901	2454	1.5
1997 Q1	7737	6455	2885	727	386	349	1282	10199	5626	4573	-2462	-7.6
Q2	6444	5692	2678	395	524	738	752	4386	2330	2056	2058	5.9
Q3	8044	6684	3140	762	453	509	1360	5167	3158	2009	2877	7.9
Q4	8388	5610	2761	519	332	393	2778	6113	4045	2068	2275	6.2
1998 Q1	6305	5025	1616	659	380	287	1280	7376	4547	2829	-1071	-3.1
Q2	7141	5363	2861	389	255	523	1778	4841	2834	2007	2300	6.7
Q3	7140	5957	3200	488	224	527	1183	5268	2893	2375	1872	5.3
Q4	7626	5809	3289	313	222	352	1817	7308	3962	3346	318	0.9
1999 Q1	6004	4422	1981	339	252	256	1582	9516	4962	4554	-3512	-10.4
Q2	6522	4909	2537	241	262	622	1613	4390	2454	1936	2132	5.9
Q3	9072	7182	4377	389	387	539	1890	4942	2874	2068	4130	11.1
Q4	7021	5065	2729	212	379	360	1956	6098	3617	2481	923	2.5
2000 Q1	8030	5468	2105	472	384	474	2562	9649	5922	3727	-1619	-4.2
Q2	7492	5952	3298	285	352	724	1540	3968	2646	1322	3524	8.7
Q3	10005	7937	4956	462	354	470	2068	4692	3245	1447	5313	12.5

Source: Ministry of Finance

**TABLE 9 : BALANCE OF PAYMENTS - Current Account**

Period	Current Account Balance		Goods Account			Services Account						Income Balance	Current Transfers
			Exports	Imports	Balance	Total	Transportation	Travel	Insurance	Govt. Servs	Other		
	S\$ Million	% of GNP	S\$ Million										
1992	9635	11.7	108432	111400	-2967	10854	-1330	5239	-596	-14	7556	2522	-774
1993	6804	7.3	125802	130204	-4401	11757	-1359	5253	-599	-8	8469	315	-866
1994	17412	16.0	149566	147497	2069	13970	-1153	4450	-674	10	11337	2384	-1010
1995	20462	16.8	167897	166512	1384	17089	-1136	3855	-878	-36	15284	3244	-1255
1996	19597	14.8	177680	174543	3136	14013	-1538	2438	-855	0	13968	3961	-1513
1997	25112	16.8	186708	185048	1660	16496	-1721	1525	-823	-24	17539	8718	-1762
1998	35188	23.7	185085	160297	24788	2402	-2304	616	-328	-27	4445	9979	-1982
1999	36026	23.3	196004	176846	19158	8160	-2899	928	-537	-50	10718	10678	-1971
1997 Q1	5131	n.a.	42369	42621	-252	3794	-390	742	-183	-14	3639	2003	-415
Q2	7804	n.a.	46253	45117	1136	4592	-429	490	-202	3	4730	2508	-431
Q3	6488	n.a.	48096	48459	-362	4995	-430	457	-220	-5	5194	2307	-452
Q4	5690	n.a.	49989	48851	1138	3115	-472	-164	-218	-8	3977	1900	-464
1998 Q1	6125	n.a.	46651	42109	4542	-265	-528	277	-166	-12	164	2333	-485
Q2	8875	n.a.	45590	39117	6473	55	-554	6	-50	-5	658	2839	-492
Q3	10177	n.a.	47545	40374	7171	1073	-744	349	-81	-8	1558	2440	-508
Q4	10011	n.a.	45299	38697	6602	1539	-478	-16	-30	-2	2065	2368	-497
1999 Q1	7738	n.a.	42315	37766	4549	917	-549	447	-81	-18	1119	2763	-490
Q2	9566	n.a.	48204	43255	4949	2369	-1014	158	-162	-6	3393	2728	-480
Q3	8417	n.a.	50283	46684	3599	2827	-658	416	-128	-12	3210	2485	-494
Q4	10305	n.a.	55203	49140	6062	2048	-678	-92	-166	-13	2998	2702	-507
2000 Q1	8321	n.a.	52098	47308	4790	1524	-1019	371	-119	-22	2313	2514	-506
Q2	8642	n.a.	57164	53464	3700	2374	-1100	17	-105	-9	3571	3101	-532
Q3	9724	n.a.	64333	58833	5500	2499	-1066	292	-103	-9	3385	2391	-667

Source: Singapore Department of Statistics

**TABLE 10 : BALANCE OF PAYMENTS - Capital & Financial Accounts**

S\$ Million

Period	Capital & Financial Account Balance	Capital Account	Financial Account						Errors & Omissions	Overall Balance	Official Foreign Reserves (End-of-Period)
			Total	Direct Investment	Portfolio Investment	Other Investment					
						Total	Banks	Others			
1992	2859	-62	2921	1446	4056	-2580	-1173	-1408	-2535	9959	65788
1993	-2074	-115	-1958	4095	-8024	1971	4391	-2421	7423	12154	77867
1994	-13633	-128	-13504	6069	-11801	-7772	1707	-9479	3522	7302	85166
1995	-6811	-101	-6710	1311	-10430	2410	7904	-5494	-1477	12174	97337
1996	-7525	-196	-7329	2890	-15531	5312	6344	-1032	-1666	10407	107751
1997	-19907	-257	-19650	-1149	-19167	666	9362	-8696	6650	11856	119617
1998	-36049	-378	-35671	11745	-13128	-34287	-17689	-16598	5841	4981	124584
1999	-29761	-324	-29437	5155	-12009	-22583	-12607	-9976	1057	7321	128457
1997 Q1	-8042	-54	-7988	424	-3863	-4549	1246	-5796	8996	6086	113848
Q2	-2178	-71	-2107	-1232	-4523	3648	2282	1366	-3946	1679	115528
Q3	-99	-59	-40	-1085	-4412	5457	4363	1093	-3486	2903	118436
Q4	-9588	-73	-9515	744	-6369	-3889	1470	-5360	5086	1188	119617
1998 Q1	-12364	-84	-12281	2859	-1992	-13147	-7877	-5270	6579	340	119956
Q2	-10992	-108	-10884	2517	-3520	-9881	-979	-8902	3327	1210	121196
Q3	-7023	-101	-6922	2729	-3918	-5733	-7985	2252	-2289	866	122062
Q4	-5670	-86	-5584	3640	-3698	-5527	-849	-4678	-1776	2566	124584
1999 Q1	-18802	-83	-18719	4133	-2224	-20628	-5965	-14663	10649	-415	124327
Q2	-7578	-93	-7485	15	-4093	-3407	-358	-3050	2811	4799	125856
Q3	-4515	-82	-4433	108	-2294	-2247	-9026	6780	-3908	-6	129593
Q4	1134	-66	1200	900	-3398	3699	2742	957	-8496	2943	128457
2000 Q1	-10992	-68	-10924	2533	-6788	-6670	-1645	-5025	501	-2171	128159
Q2	-1761	-79	-1681	578	-6197	3938	6245	-2307	-1022	5860	134431
Q3	-438	-71	-367	601	-5262	4295	7489	-3195	-4912	4374	135953

Source: Singapore Department of Statistics  
Monetary Authority of Singapore

**TABLE 11 : EXCHANGE RATES**

End of Period	Singapore Dollar Per									
	US Dollar	Pound Sterling	EURO	100 Swiss Franc	100 Japanese Yen	Malaysian Ringgit	Hong Kong Dollar	100 New Taiwan Dollar	100 Korean Won	Australian Dollar
1992	1.6449	2.4867		112.39	1.3198	0.6306	0.2125	6.4758	0.2086	1.1312
1993	1.6080	2.3802		108.61	1.4364	0.5953	0.2082	6.0338	0.1989	1.0885
1994	1.4607	2.2782		111.18	1.4628	0.5707	0.1888	5.5370	0.1850	1.1341
1995	1.4143	2.1884		122.61	1.3744	0.5567	0.1829	5.1821	0.1827	1.0540
1996	1.3998	2.3670		103.80	1.2046	0.5538	0.1809	5.0919	0.1657	1.1150
1997	1.6755	2.7771		115.23	1.2893	0.4313	0.2162	5.1433	0.0993	1.0935
1998	1.6605	2.7666		120.15	1.4484	0.4370	0.2143	5.1552	0.1394	1.0190
1999	1.6660	2.6914	1.6810	104.50	1.6272	0.4384	0.2143	5.3142	0.1471	1.0896
1997 Q1	1.4451	2.3609		99.49	1.1654	0.5829	0.1865	5.2468	0.1635	1.1330
Q2	1.4300	2.3793		98.41	1.2513	0.5665	0.1845	5.1417	0.1610	1.0660
Q3	1.5295	2.4626		105.05	1.2641	0.4783	0.1976	5.3476	0.1672	1.1030
Q4	1.6755	2.7771		115.23	1.2893	0.4313	0.2162	5.1433	0.0993	1.0935
1998 Q1	1.6060	2.6926		105.54	1.2200	0.4412	0.2073	4.8951	0.1155	1.0673
Q2	1.7068	2.8461		112.16	1.2141	0.4098	0.2203	4.9509	0.1237	1.0462
Q3	1.6850	2.8783		121.59	1.2456	0.4434	0.2175	4.8954	0.1216	1.0070
Q4	1.6605	2.7666		120.15	1.4484	0.4370	0.2143	5.1552	0.1394	1.0190
1999 Q1	1.7322	2.7914	1.8548	116.21	1.4385	0.4558	0.2235	5.2253	0.1413	1.0886
Q2	1.7013	2.6787	1.7562	109.76	1.4105	0.4477	0.2193	5.2736	0.1468	1.1255
Q3	1.7026	2.8002	1.8129	113.28	1.5941	0.4480	0.2192	5.3556	0.1399	1.1124
Q4	1.6660	2.6914	1.6810	104.50	1.6272	0.4384	0.2143	5.3142	0.1471	1.0896
2000 Q1	1.7189	2.7406	1.6488	103.48	1.6279	0.4523	0.2208	5.6394	0.1554	1.0431
Q2	1.7294	2.6252	1.6468	105.76	1.6393	0.4551	0.2218	5.6139	0.1551	1.0348
Q3	1.7410	2.5479	1.5336	100.62	1.6122	0.4582	0.2233	5.5587	0.1561	0.9472

Source: Monetary Authority of Singapore