

## THE DERIVATIVES MARKET IN HONG KONG \*

With an average turnover of foreign exchange and interest rate derivatives amounting to US\$74 bn per day in April 1995, Hong Kong was the seventh largest trading centre in the world. The notional amount of outstanding derivatives contracts at end March 1995 was US\$1.6 trillion.

### Introduction

Derivatives are financial instruments whose value 'derives' from that of other financial instruments.<sup>1</sup> The Hong Kong Monetary Authority conducted a survey on the size of the derivatives market in Hong Kong in March and April 1995. This is part of a global survey coordinated by the Bank for International Settlements (BIS). For the first time questions on derivatives were added to the triennial survey of the foreign exchange market.<sup>2</sup>

In Hong Kong the survey covered all authorised institutions, which included 178 licensed banks, 62 restricted licence banks and 136 deposit taking companies. Several financial institutions which

are major securities firms or investment houses were also invited to participate in the survey. A total of 26 countries participated in the global survey. The BIS released preliminary global results in December 1995 and plans to release more detailed results in the first half of 1996.

### Turnover of derivatives contracts

The average turnover of foreign exchange and interest rate derivatives was US\$74 billion in terms of notional amount per business day during April 1995 in Hong Kong, ranking it seventh among all participating centres (Table 1). The figure is adjusted to eliminate double counting between reporting institutions in Hong Kong.<sup>3</sup> This compared to the global total of US\$2,298 billion.<sup>4</sup>

Table 1:  
Average daily turnover in notional amounts of  
foreign exchange and interest rate derivatives contracts in April 1995

Country	Foreign Exchange		Interest Rate		Total	
	US\$bn	Rank	US\$bn	Rank	US\$bn	Rank
United Kingdom	301	1	296	2	597	1
Japan	112	3	477	1	589	2
United States	137	2	222	3	359	3
France	37	8	109	4	146	4
Singapore	63	4	40	6	103	5
Germany	45	6	47	5	92	6
<b>Hong Kong</b>	<b>56</b>	<b>5</b>	<b>18</b>	<b>8</b>	<b>74</b>	<b>7</b>
Australia	23	9	37	7	60	8
Switzerland	45	7	7	12	52	9
Canada	19	12	15	9	35	10
Belgium	22	11	10	10	33	11
Denmark	23	9	4	16	26	12
All countries	968		1,330		2,298	

\* This article is primarily the work of Kitty Lai of the Economic Division, who led the team conducting the survey in Hong Kong.

1 For an academic's perspective on derivatives, see "Derivatives: Boon or Bane?" in the May 1995 issue of the *Quarterly Bulletin*. For a discussion of HKMA's view, see "Derivatives: Market Development and Risk Management" in the February 1995 issue.

2 The results on foreign exchange activities were released in September 1995 and described in detail in an article in the November issue of the *Quarterly Bulletin*.

3 Unless otherwise specified, all figures in the article are net turnover or outstanding amounts which are adjusted to eliminate double counting between institutions in Hong Kong. Unadjusted figures are referred to as gross amounts. Note also that the exchange traded figures are not adjusted for double counting. Turnover figures for equity, stock index and commodity derivatives were not collected in the survey.

4 Figure refers to the sum of all 26 participating centres in the survey, i.e. not adjusted for double counting between participating centres. BIS believes the survey covered about 90% of intermediaries active in the derivatives market.

Over-the-counter<sup>5</sup> foreign exchange derivatives contracts accounted for slightly over three quarters of the total trading in Hong Kong, which was much higher than the global figure of 35%. The share of interest rate derivatives was correspondingly smaller. This reflects the small bond market in Hong Kong, as interest rate derivatives are frequently used to hedge bonds or other debt securities. The size of the HK dollar bond market stood at US\$25 bn at end 1995, compared to US\$7 trillion in US and US\$3 trillion in Japan in 1994. In part, this reflects the history of budget surplus in Hong Kong. Nevertheless, the bond market is expected to develop rapidly in Hong Kong. The massive infrastructure projects in Hong Kong and Asia (especially China) provide many opportunities for debt market development. HKMA's recent issuance of seven-year Exchange Fund Notes has lengthened the benchmark yield curve for HK dollar issues. The proliferation of new products such as mortgage backed securities and asset backed securities should also enhance the development of the bond market and thus the interest rate derivatives market in Hong Kong.

### **Amount of derivatives contracts outstanding**

The notional amount of outstanding derivatives contracts booked in Hong Kong totalled US\$1,644 billion at end March 1995. The majority were OTC contracts, amounting to US\$1,450 billion with a market value of US\$67 billion. Notional amount refers to the face value on which payments under derivatives contracts are based and does not represent the value of payments exchanged. Market value represents the value of derivatives contracts at current market prices. Therefore, market value, rather than notional amount, is more meaningful for interpreting the risk exposure from OTC derivatives.

The market value of outstanding derivatives contracts was very small as compared to the notional amount and represented less than 7% of total banking assets. Furthermore, in practice risk exposures are reduced by the use of bilateral

netting and collateral arrangements and will therefore be smaller than market values.<sup>6</sup>

As shown from the breakdown by types of derivatives in table 2, foreign exchange and interest rate derivatives are held on a much larger scale than derivatives on equities, stock indices and commodities. This situation is similar to the global picture (see Charts 1 and 2).

The small amount of daily turnover relative to the contracts outstanding may suggest that a large proportion of contracts were held for hedging purposes rather than for trading. In addition, the higher ratio of turnover to outstanding amounts of foreign exchange derivatives suggests that these contracts are more frequently traded than interest rate derivatives.

Overseas incorporated banks accounted for 86% of gross turnover and 88% of the outstanding amount in Hong Kong. The top 10 players accounted for 55% of the gross turnover and 58% of the outstanding amount. The concentration is not particularly high compared to the 80% of total outstandings in the US. There is evidence of some specialisation with some different firms among the larger players in the interest rate derivatives and the foreign exchange derivatives markets.

### **Foreign exchange derivatives**

The daily turnover of foreign exchange derivatives averaged US\$56 billion in terms of notional amount during April 1995. Hong Kong was the fifth largest trading centre for foreign exchange derivatives.

The notional amount of foreign exchange derivatives outstanding at end March 1995 was US\$970 billion. Almost all of them (US\$966 billion) were OTC contracts. This is similar to the global pattern. Nevertheless, the market value of the outstanding OTC contracts was small at US\$60 billion. The market value was only about 6% of the notional amount, compared to the global figure of 8%. The turnover of foreign exchange derivatives almost doubled since the April 1992 survey, contributed mainly by the substantial growth in the trading of forwards.

5 Over-the-counter derivatives are traded off organised exchanges. They are custom-tailored to meet an institution's needs, while exchange traded contracts are typically standardised as to maturity, contract size, and delivery terms.

6 In case of exchange traded derivatives, the counterparty is the derivatives exchange and thus the credit risk is low as compared to the OTC derivatives.

Table 2:  
Derivatives markets by type

US\$bn

Types of derivatives	Average daily net turnover during April 1995		Net outstanding amounts as at end March 1995 in terms of			
	Hong Kong	Global	Notional amount		Market value	
			Hong Kong	Global	Hong Kong	Global
Foreign exchange						
– Over-the-counter derivatives	56.4	688	966.3	13,153	59.8	1,021
– Exchange traded derivatives	0.0	15	3.8	120	N.A.	N.A.
– Subtotal	56.4	703	970.1	13,273	N.A.	N.A.
Interest rate						
– Over-the-counter derivatives	3.5	151	476.9	26,645	6.4	646
– Exchange traded derivatives	14.3	1,121	189.2	15,674	N.A.	N.A.
– Subtotal	17.9	1,272	666.1	42,319	N.A.	N.A.
Equity and stock index						
– Over-the-counter derivatives	N.A.	N.A.	5.4	599	0.8	50
– Exchange traded derivatives	N.A.	N.A.	0.5	645	N.A.	N.A.
– Subtotal	N.A.	N.A.	5.9	1,244	N.A.	N.A.
Commodity						
– Over-the-counter derivatives	N.A.	N.A.	1.1	317	0.0	28
– Exchange traded derivatives	N.A.	N.A.	0.6	142	N.A.	N.A.
– Subtotal	N.A.	N.A.	1.7	459	N.A.	N.A.
Total						
– Over-the-counter derivatives	59.9*	839*	1,449.7	40,714	67.0	1,745
– Exchange traded derivatives	14.3*	1,136*	194.0	16,581	N.A.	N.A.
– Grand total	74.3*	1,975*	1,643.8	57,295	N.A.	N.A.

Notes: (1) The net figures is obtained after adjustment for double reporting between authorised institutions in Hong Kong, except for equity, stock index and commodity derivatives.

(2) Figures may not add up to total due to rounding.

(3) \* excluding equity and commodity based derivatives.

(4) N.A. – not available as the data were not collected in the survey.

Chart I  
Notional amounts of derivatives contracts outstanding at end-March 1995

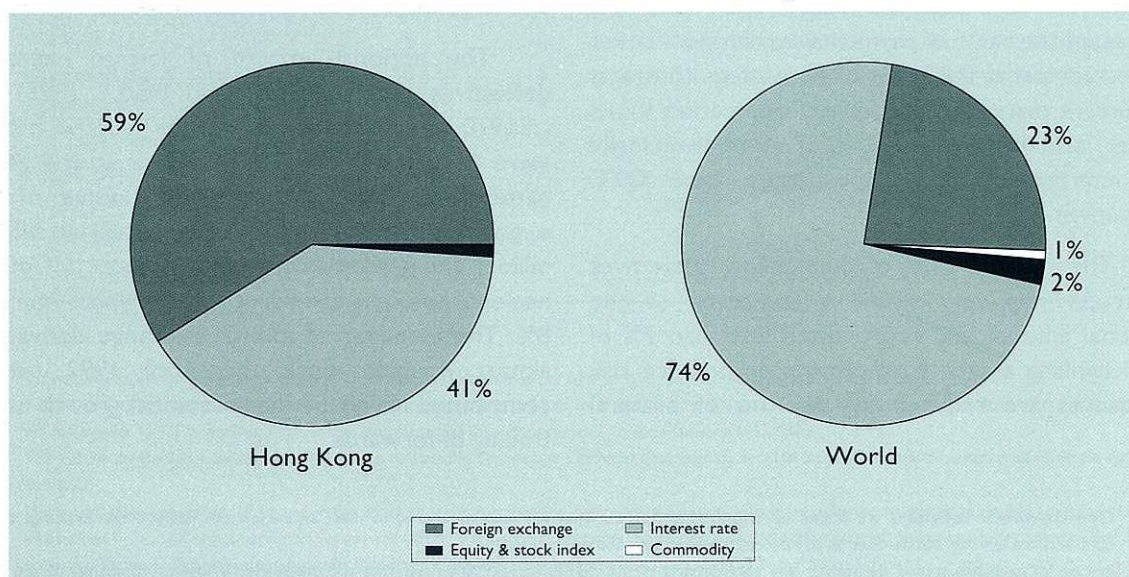


Chart 2  
Notional amounts of derivatives contracts outstanding at end-March 1995

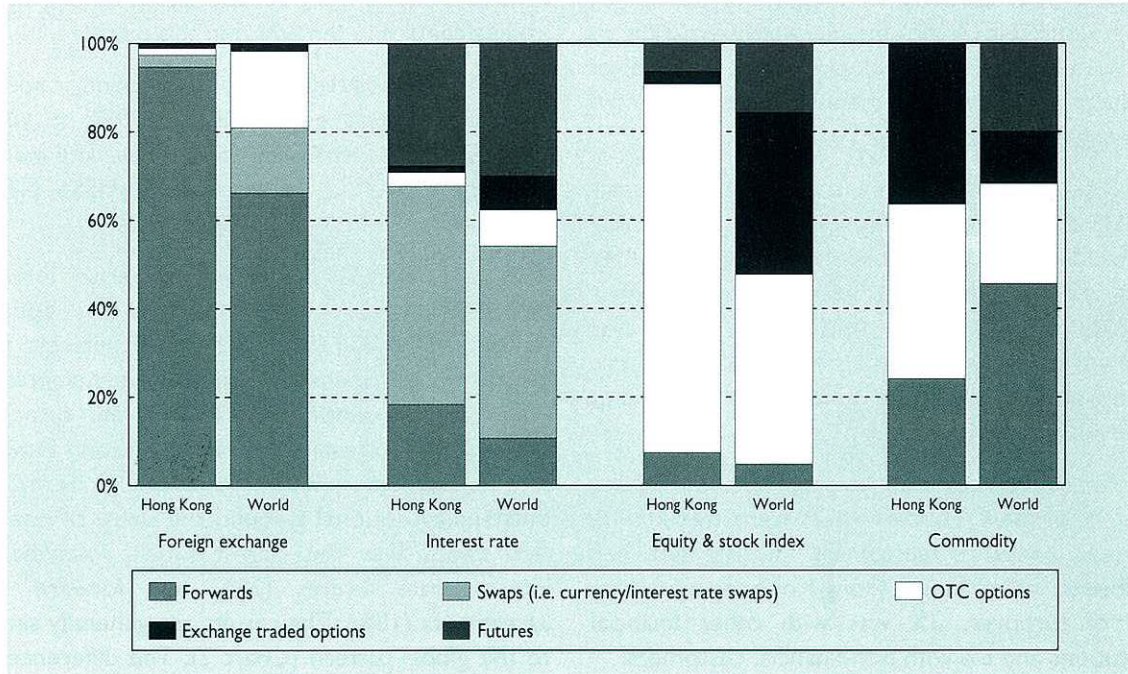
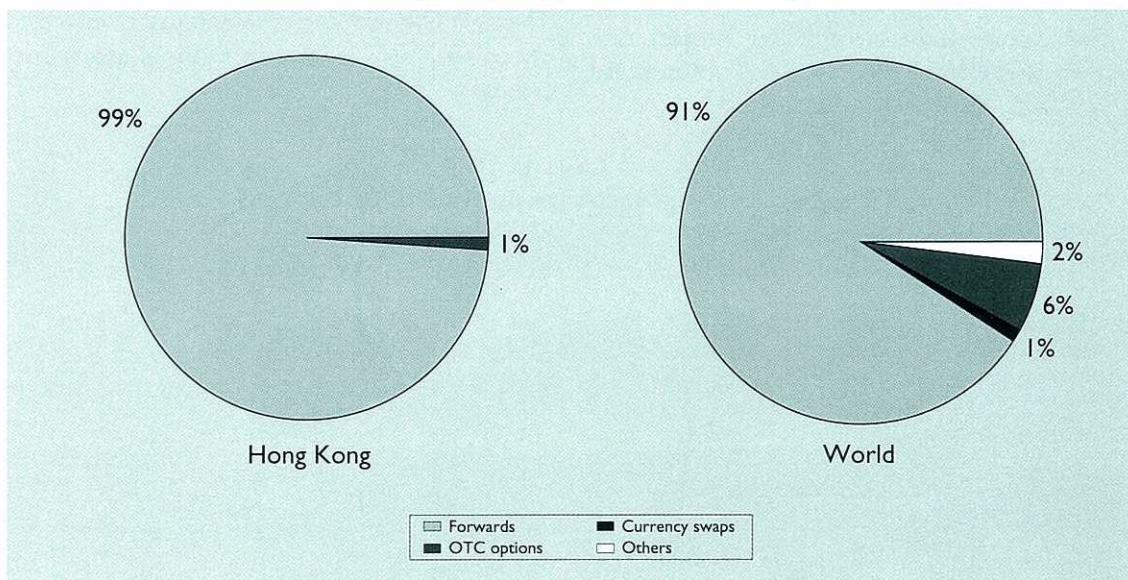


Chart 3  
Turnover of foreign exchange derivatives during April 1995



Foreign exchange derivatives include forwards, currency swaps,<sup>7</sup> options and futures. Similar to the global pattern, forwards (including both outright forwards and the forward leg of foreign exchange

swaps) were the most commonly traded type of contract (Chart 3). However, the share of forwards was higher in Hong Kong in terms of both turnover and outstanding amounts (about 95%

<sup>7</sup> Currency swaps involve exchange of streams of fixed or floating interest payments in different currencies for an agreed period of time and exchange of principal amounts in different currencies at an agreed exchange rate at the end of the period.

compared to 70% for the global market). This reflects the less frequent use of more sophisticated products such as currency swaps and options in Hong Kong. However, the derivatives market in Hong Kong is still developing and the use of products such as currency swaps can be expected to become more prevalent.

The most commonly traded currency pair was US dollar/Japanese yen, followed by US dollar/Deutschemark and US dollar/HK dollar (Chart 4). Some market participants believe that the higher volatility of US\$/yen in April, when the dollar reached a post-war low against the yen before turning around, made the trading in this currency pair even higher than usual.

In respect of counterparties, about three quarters of the OTC derivatives were traded with overseas banks or customers. Trading between authorised institutions in Hong Kong accounted for 15% of turnover, 3% was with other financial institutions and 6% with non-financial customers.

Nearly all (97%) outstanding contracts had a remaining maturity of less than one year.

### Interest rate derivatives

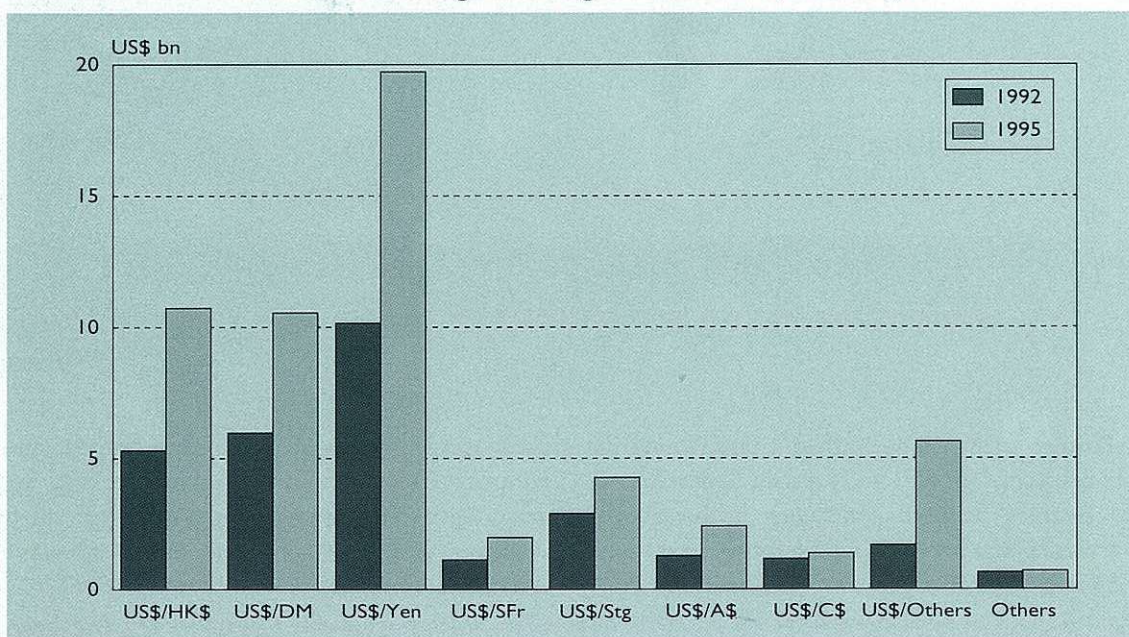
The average daily turnover of interest rate derivatives was US\$18 billion in terms of notional

amount during April 1995, comprising US\$4 billion OTC contracts and US\$14 billion exchange traded contracts. Hong Kong ranked eighth among major trading centres in the world in this market.

The outstanding notional amount stood at US\$666 billion at end March 1995, of which US\$477 billion were OTC derivatives. The market value of the OTC derivatives was US\$6 billion, only about 1% of the notional amount.

Interest rate derivatives comprise forward rate agreements, interest rate swaps, options, futures and other OTC derivatives. Interest rate futures were the most commonly traded derivatives (Chart 5), accounting for 75% of the turnover, followed by interest rate swaps (10%) and forward rate agreements (9%). However, in terms of outstanding notional amount, the share of interest rate swaps was the largest (50%), followed by interest rate futures (28%) and forward rate agreements (18%). The results are generally similar to the global pattern (Chart 2). The differences in the shares of turnover and outstanding notional amount reflect more frequent transactions as well as shorter maturity of futures. Interest rate swaps are less frequently traded and have longer maturity. This is in line with the common use of interest rate swaps to hedge long term financial assets such as bonds.

Chart 4  
Turnover of foreign exchange derivatives by currency



Note: Currency swaps are not included in 1992 figures.

Chart 5  
Turnover of interest rate derivatives during April 1995

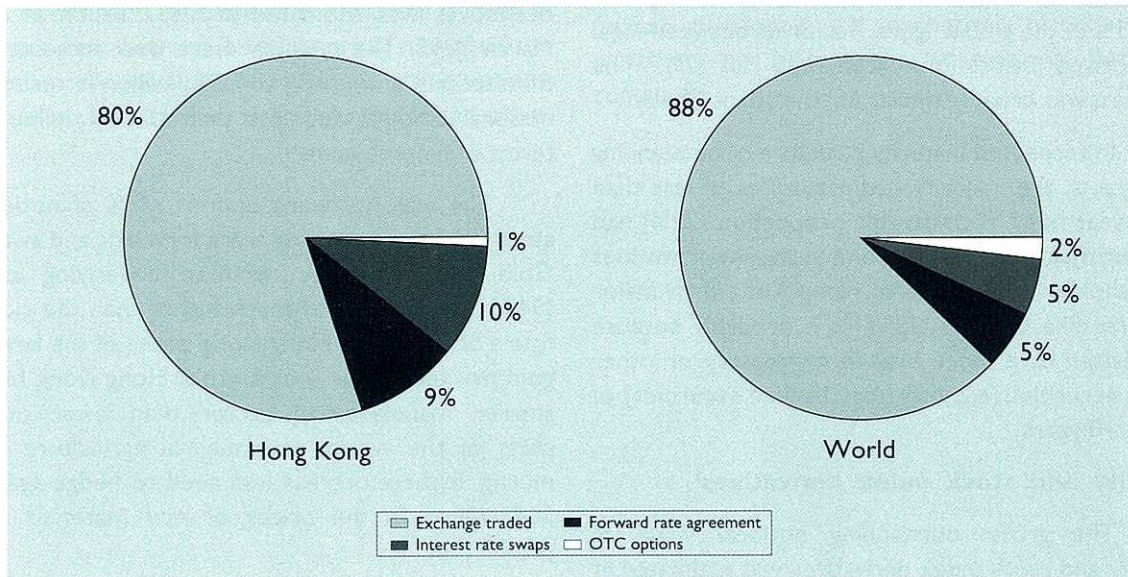
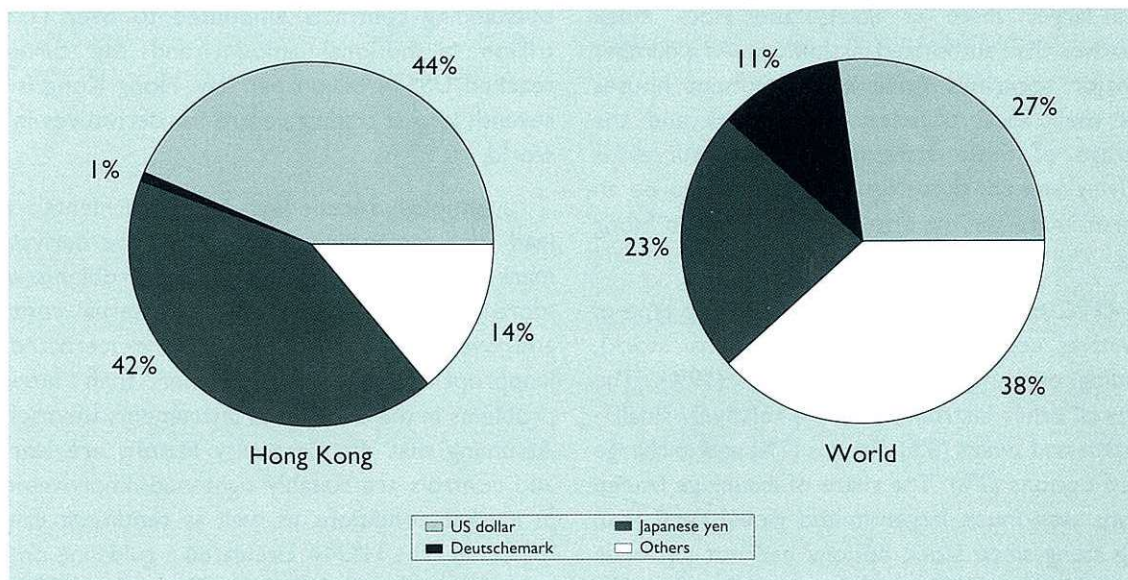


Chart 6  
Turnover of interest rate derivatives by currency



Note: Figures cover over-the-counter derivatives only.

In respect of currency, US dollar and Japanese yen interest rate derivatives each accounted for over 40% share in terms of both turnover and stock (Chart 6). The share of HK dollar interest rate derivatives was small, accounting for 3% of the daily turnover and 10% of the outstanding notional amount. Compared to the global pattern, Hong

Kong had a higher proportion of yen interest rate derivatives (41% vs 22% in terms of outstanding notional amount) but a smaller proportion of Deutschemark interest rate derivatives (4% vs 12%) which probably reflects Hong Kong's closer links with Japan as well as European centres' closer links with Germany.

The vast majority of OTC interest rate derivatives were transacted with overseas banks or customers (over 90% of net turnover), as compared to 65% of the global figure. Turnover between local authorised institutions accounted for 7%. The pattern was broadly similar for the stock figures.

In respect of maturity structure of outstanding contracts, the majority had maturities of less than one year but a considerable proportion (22%) had longer maturities of over one year. The maturities are shorter in the case of Hong Kong than major centres like UK and US. This is probably because the latter have more long term treasury or other debt securities (e.g. mortgage backed securities) of over 10 years.

#### Equity and stock index derivatives<sup>8</sup>

The gross<sup>3</sup> outstanding notional value of equity and stock index derivatives was estimated at US\$6 billion at end March 1995. OTC derivatives amounted to US\$5 billion in terms of notional amount, corresponding to a market value of only US\$0.8 billion. Securities firms and investment houses play a large role in this market, accounting for a larger share of equity and stock index derivatives than authorised institutions. As a number of major securities firms or investment houses book their local transactions overseas and the coverage of these institutions in the survey is relatively limited, these figures are likely to be an underestimate for the size of this market in Hong Kong.

OTC options were the most popular type of derivatives contract (84% of the notional stock), including exchange traded warrants<sup>9</sup> (19%). The shares of other instruments were relatively small – forwards and swaps (8%), futures (7%) and exchange traded options (2%). The share of exchange traded options was much larger in the global total than Hong Kong since stock options had not yet been launched in Hong Kong at the time of the survey.

Not surprisingly, Hong Kong equities and the Hang Seng index were the most common underlying assets.

#### Commodity derivatives

The gross<sup>3</sup> notional stock of commodity derivatives was estimated at US\$2 billion at end March 1995. The majority were over-the-counter transactions, amounting to US\$1 billion in terms of notional amount and less than US\$0.1 billion in terms of market value.

The majority were options (77% of notional stock) and the remaining were forwards and swaps. Gold was the most common underlying asset (94%). The figure was much higher than the global figure of 47% since Hong Kong is one of the largest gold markets in the world. Also, Hong Kong has a smaller manufacturing sector than most other parts of the world, and minimal agriculture and mining. It therefore has less need to hedge against fluctuations in the prices of raw materials and production.

#### Conclusion

The survey confirms Hong Kong's status as an international financial centre with significant trading and use of a variety of derivatives products. The outstanding contracts amounted to over US\$1.6 trillion in notional amount and the turnover reached US\$74 billion per day. Hong Kong is the seventh largest trading centre for derivatives in the world.

Although recent high-profile incidents<sup>10</sup> may lead to a temporary slowdown in the derivatives market, in most of these cases the problems were more related to a lack of basic internal controls and over-trading, in some cases exacerbated by inappropriate incentives, rather than intrinsic problems in the derivatives instruments themselves. Assuming that the necessary lessons are learned and controls are suitably tightened, improvements in market conditions as well as sentiment can be expected. The HKMA circulated a guideline on risk management of derivatives in December 1994.<sup>11</sup> It is now in the process of drafting operational guidelines on derivatives trading for authorised institutions and studying the Basle Committee's

8 In consideration of the burden on reporting institutions and the lesser relevance of equity, stock index and commodity derivatives to the conduct of monetary policy, less detailed data are collected for these derivatives. As such, turnover figures are not available. Also, only outstanding amounts on a gross basis are available as counterparty information necessary to eliminate double-counting between reporting institutions was not collected in Hong Kong.

9 Warrants traded on securities exchanges are included under OTC options in the BIS survey because exchange traded options are defined as instruments which are created by derivatives exchanges themselves and where derivatives exchanges are the counterparties to the transactions.

10 Examples include Barings, Proctor & Gamble, Bankers Trust, Orange County, Daiwa etc.

11 See "Surveys on Risk Management of Derivatives" in the May 1995 issue of the *Quarterly Bulletin*.

proposals on the capital required to support market risks.

Continued developments, including growth of the bond market, and development of new products such as asset backed securities and stock options, should provide impetus to the growth of derivatives

market in Hong Kong. In addition, the rapid economic growth in China and other Asian countries should provide Hong Kong more opportunities in further developing the derivatives market, thus enhancing her role as an international financial centre. ☺