A survey on hedging markets in Asia: a description of Asian derivatives markets from a practical perspective

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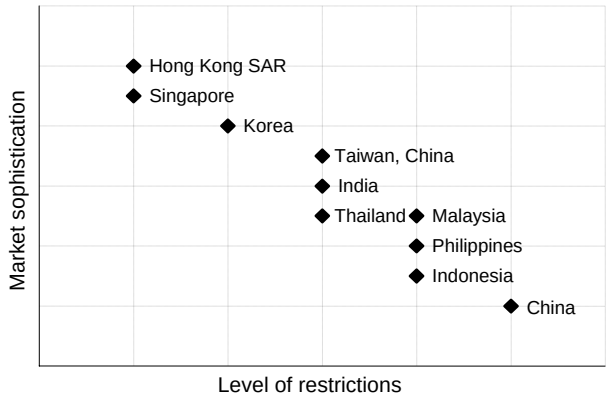
Introduction

Since the Asian crisis, there has been tremendous growth in Asian bond markets that, in many cases, has not been matched with commensurate growth in derivative products. For those markets that grew out of the financial sector recapitalisation prior to the middle of 2003, there was precious little experience of bearish bond market movement, and therefore perhaps inadequate appreciation of the importance of hedging instruments at that time. However, while liquid hedging instruments may not be strictly necessary for the formation of a bond market, they are recognised as critical to its long-run success. The movement of Asian central banks to better develop fixed income markets should therefore also endeavour to strengthen the development of derivatives markets. As a first step in this effort, we present below a description of the current state of hedging markets in the region.

The current state and future potential of Asian derivatives markets

Many Asian currency and interest rate derivatives markets are still in the very early stages of development, while others boast a relatively broad range of derivative products. We find that there exists a strong inverse relationship between market sophistication and regulatory restrictions. The two top financial centres in the region, Hong Kong SAR and Singapore, undoubtedly have the most advanced derivatives markets with the least regulation, while at the other end of the spectrum are China and Indonesia who lag behind most of their Asian neighbours. Other countries fall somewhere in between, as depicted below.

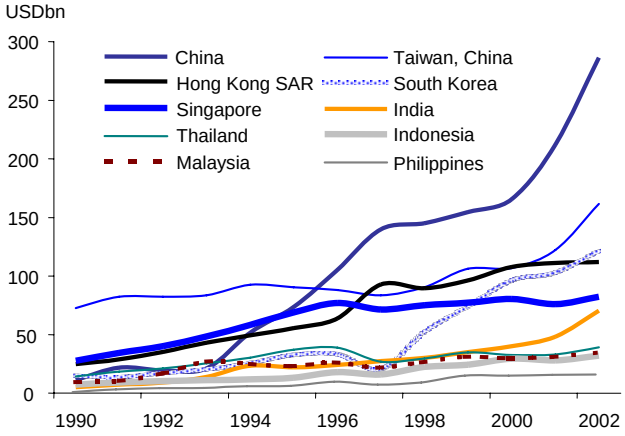
Level of restrictions vs market sophistication



Source: DB Global Markets Research.

The development of the underlying bond market is surely one of the key factors in the growth of the derivatives market. Since the financial crisis, Asian local bond markets have grown rapidly and the size of nine East Asian local bond markets was estimated to be USD 1.2trn at the end of 2002. In comparison with the more developed economies, however, bond markets remain small. The total East Asian bond market, in fact, amounts to only about 20% of the Japanese market. The average size of the bond market in those countries was 46% of GDP, compared to 169% in Japan and 156% in the United States, suggesting continued high growth potential in the years to come.[1] In order to grow an institutional investor base, particularly an international one, the depth and breadth of the bond market will need to increase, inevitably entailing improvements in the liquidity and diversity of available hedging tools. Regulators in many countries have been moving toward increasing support for derivative products, but there are still apparent inconsistencies in policy approaches. In many countries, the ability to maintain currency stability has been an important regulatory consideration since the 1997 Asian crisis. Different policy reactions to the currency speculation during the crisis and the subsequent high level of FX volatility have set the pace for the capital market liberalisation. For example, under the strict IMF program, Korea has been aggressive in liberalising capital flows while Malaysia reversed its policy to a tightly controlled capital account regime.[2] Although several countries still maintain strict FX regulations, strong regional recovery and rapid accumulation of the FX reserves bode well for further liberalisation of the Asian currency markets.

Asian FX reserves



Source: CEIC and IMF.

FX derivatives

The degree of regulatory restrictions varies widely across the region; however, the common purpose of FX control is to protect the local currency from speculation. Therefore, the most frequent form of FX regulation is to impose hedging requirements on the FX trades. The authorities often apply stricter rules to non-resident trades. Any restrictions on free capital

[1] ADB (2003).

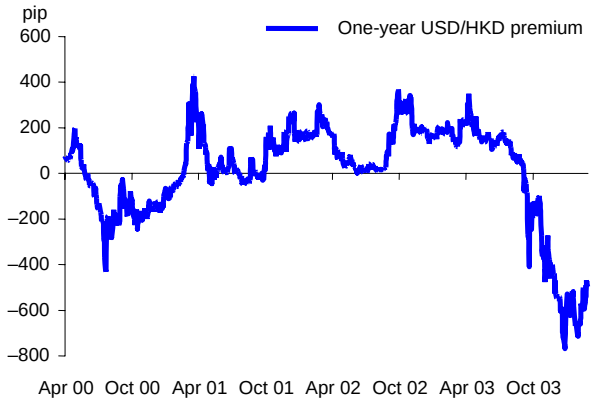
[2] Park and Bae (2002).

mobility can create inefficiencies by not allowing market participants to take full advantage of pricing differences. This is unfortunate since foreign participation could be an important catalyst for the growth of Asian bond and derivatives markets, especially in the early stages. Since restrictions on FX derivatives transactions have a direct result on the formation of other derivatives markets, they represent an appropriate place to start our survey of derivatives markets.

Hong Kong

Despite the fixed exchange rate regime, Hong Kong has the most liquid and efficient FX market in the region. There are no restrictions on the onshore FX derivatives market in Hong Kong. Foreigners can freely trade in the onshore market, so there has not been a need for a non-deliverable forwards (NDF) market in HKD. The FX forward market is used to hedge currency exposure on liabilities and assets, as well as to speculate on the yield curve movements. The market is very liquid up to one-year maturity. The one-year USD/HKD forward, which generally reflects market sentiment on the currency peg, is watched closely by the market and the Hong Kong Monetary Authority (HKMA). Despite the fixed exchange rate, the one-year USD/HKD premium has actually been quite volatile in recent years. Local economic news, comments from senior officials in Hong Kong or China on the subject of the linked exchange rate, and comments from international rating agencies are some of the factors that have influenced the forward premium in the past. In 2003 alone, it went from +350 pips when SARS hit Hong Kong in early 2003, to below –600 pips because of a flood on liquidity into the economy following the September 2003 G10 meeting which increased expectations of a regional currency realignment.

One-year USD/HKD forward premium



Source: DB Global Markets Research.

Singapore

The Monetary Authority of Singapore (MAS) has continued to drive the expansion in the FX derivatives market through liberalisation. For example, in 2002, the MAS revised Notice 757 to allow non-residents to transact freely in SGD FX options without filing documentation on the purpose of each transaction. However, a few basic restrictions still apply to protect the currency from speculation. For example, banks' lending to non-resident financial institutions cannot exceed SGD 5m per entity.

Korea

In 1999, Korea lifted most of the existing restrictions on the FX market, but has recently reversed some of this liberalisation. Prior to 1999, all forward FX transactions required certification as hedges against expected current account transactions. The onshore forward market is highly liquid out to one year, but supporting documentation is required if there is to be a physical delivery. Unlike Singapore or Hong Kong, Korea maintains an NDF market where onshore banks are also permitted to participate with other banks or corporates. No prior reports or approvals are required for NDF transactions. The regulatory environment suddenly tightened in January 2004 in order to discourage offshore investors' speculative demand for KRW. The government put a ceiling on domestic financial institutions' NDF positions with non-residents. Local financial institutions were originally banned from increasing net long dollar positions via NDF trades by more than 10%, or decreasing net short positions by more than 10%, based on their position on 14 January and 16 January 2004 respectively. Later, the restriction was mitigated for net short dollar positions. For FX options, the up-front premium should be under 20% of option notional amount, otherwise prior approval from the Bank of Korea (BoK) is required. If there is to be a physical delivery at the options maturity, the underlying trade documentation must comply with regulations on forward transactions. The currency options market is also liquid, volume of about USD 250m traded in the non-deliverable options (NDO) market.

Taiwan, China

The primary goal of the Central Bank of China (CBC) is to prevent speculative activity in the currency market to maintain the financial stability of Taiwan, China (hereinafter referred to as Taiwan). Maintaining export competitiveness against countries such as Japan and Korea is also a major concern for the authorities. The CBC manages the currency via capital controls and direct intervention, which is supported by its substantial foreign exchange reserves. Onshore FX spot, forwards and options trades must be explicitly approved by the relevant regulatory authority. Non-residents are not allowed to access the onshore deliverable market, preventing arbitrage flows in the onshore FX and interest rate markets. Liquidity in the NDF market is relatively good, but onshore banks are not allowed to book an NDF trade with onshore corporates.

Thailand

In January 1998, the Bank of Thailand (BoT) lifted a number of measures imposed previously to stem FX speculation. In particular, domestic financial institutions were allowed to engage in spot transactions involving THB with non-residents so that the onshore and offshore spot THB FX markets became reunited. To safeguard against speculation in the FX market, however, credit facilities provided by each financial institution to non-residents where there is no underlying trade or investment activity in Thailand are subject to a maximum outstanding limit of THB 50m per counterparty. There are no size restrictions on hedging short THB forward positions, however. In an effort to curb speculative capital inflows, the BoT recently introduced new measures. Effective as of 12 September 2003, onshore banks were banned from borrowing more than THB 50m from each non-resident without underlying transactions for less than three months, including transactions similar to borrowing such as buying FX forwards and selling/buying FX swaps. On 14 October 2003, additional measures were introduced to prevent THB speculation. The key changes were: (i) the outstanding non-resident THB balance cannot exceed THB 300m per account and (ii) non-resident THB accounts are locked in for at least six months without interest.

Malaysia

In Malaysia, strict capital controls were imposed in September 1998 to insulate Malaysia from the financial crisis. The government still maintains some strict regulations on the

currency market. Hedging of foreign exchange exposure must be related to trade activities and cannot exceed a tenor of one year. Non-residents can only access the onshore forward market for the purpose of purchasing MYR securities listed on the KLSE. Financial hedging (for example, hedging of profit repatriation, loan payment) is not allowed without Bank Negara Malaysia (BNM)'s prior approval. An NDF market is not regularly available for MYR.

Indonesia

Under the IMF program, Indonesia's FX policy has been directed at preventing extreme volatility in the currency. The Bank Indonesia (BI) tightened capital control in January 2001 by issuing regulations prohibiting IDR transfers to offshore entities, unless supported by underlying trade or investment transactions. These restrictions quickly spawned the development of an NDF market starting in February 2001. Main hedgers are corporates, but hedge trades are somewhat uncommon, due to high negative carry.3 Liquidity in the onshore and offshore market is generally low. With the exit from the IMF program at the end of 2003, and inflation trending lower, the Bank Indonesia may move back to a more liberal exchange rate regime.

Philippines

In the Philippines, Banko Sentral Ng Pilipinas (BSP) operates a managed floating exchange rate regime in which capital controls, close observation of market positions and intermittent interventions are used to prevent speculative activity. Corporates are the main hedgers for their USD loans. Liquidity in both the spot and forward markets is generally quite low. Poor liquidity and instability in the Philippines have led to squeezes in the peso market. The basic principle of the BSP in managing foreign exchange is that, outside of the banking system, foreign currency may be freely bought and sold against the peso. Hence, there is no prohibition against, for example, exporters selling their USD directly to importers or even to private investors. FX regulations therefore focus primarily on bank transactions, and the specific rules and restrictions depend on the nature of the transaction as well as the type of counterparty. In general, onshore banks may buy foreign currency from both onshore and offshore counterparties, without prior BSP approval or any documentation requirements. An onshore interbank FX options market does not exist and even the offshore market is mainly inactive.

India

Historically, India experienced substantial ongoing fiscal deficits and persistent current account deficits. Consequently, the Reserve Bank of India (RBI) maintained capital controls in an attempt to prevent speculative activity in the rupee market. In recent years, however, the underlying economic conditions have changed dramatically. India now runs a surplus current account and substantial capital inflows have allowed foreign exchange reserves to balloon. The RBI has therefore eased several restrictions and allowed FX derivative trades for hedging purposes, and the trend towards further flexibility is expected to continue. Most recently, RBI decided to permit foreign currency/rupee options as of 7 July 2003 in order to further develop the derivatives market in India and expand the spectrum of hedging products for currency exposure. Authorised dealers can offer plain vanilla European options and customers can purchase call or put options. The writing of options by customers is not permitted. As in the FX spot and forward markets, customers who have genuine foreign currency exposures are eligible to enter into options contracts, and authorised dealers can use the product for the purpose of hedging trading books and balance sheet exposure. FX options trading is still thin, however.

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[3] The academic evidence strongly rejects the hypothesis that the forward exchange rate is an unbiased predictor of the future spot rate. Currencies that trade at a forward discount, on average, weaken less than the amount implied by the forward discount, which is known as the "forward rate bias".

Table 1

A summary of Asian FX derivatives markets

	HKD	SGD	KRW	TWD	THB	MYR	INR	IDR	PHP	CNY
FX forward										
Restriction	None	None	Minimal	Prior approval	Hedging only	Onshore only	Hedging only	Offer restricted	Offer restricted	Restricted
Liquidity	Good	Good	Good	Good	Good	Good	Good	Average	Average	
Trade size	USD 20-50m	USD 25m	USD 10-20m	USD 1-10m	USD 5-20m	USD 10-20m	USD 1-5m	USD 0.5-30m	USD 2-5m	
B/as spread	0.0005-0.0010	0.0002-0.0010	0.3-1.0	0.002-0.020	0.01-0.100	0.0005	0.03-0.05	10-80	0.02-0.25	
Daily volume	USD 3-5bn	USD 6bn	USD 1bn	USD 500-700m	USD 300-600m	USD 100-200m	USD 150m	USD 200m	USD 75m	
FX options										
Restriction	None	None	Minimal	Prior approval				Offer restricted		
Liquidity	Good	Good	Good	Good	Hedging only	Market non-existent	Hedging only	Average	Market non-existent	Market non-existent
Trade size	USD 25-50m	Up to USD 30m	USD 20-50m	USD 20m	No interbank		Just allowed	USD 0.5-3m		
B/as spread	0.2-0.5 vol	0.5-1.0 vol	1 vol	0.3-1.0 vol				5-7 vol		
Daily volume	USD 50-100m	USD 50 m	USD 50m	USD 50m				USD 20m		
NDF										
Restriction			None	Interbank only			None	None	None	Interbank only
Liquidity	Market non-existent	Market non-existent	Good	Good	Market non-existent	Market non-existent	Good	Average	Average	Good
Trade size			USD 5-10m	USD 3-10m			USD 3-5m	USD 3m	USD 2-5m	USD 5-10m
B/as spread			0.5 won	0.03-0.05			0.05-0.20	20-100	0.15-0.50	0.001-0.005
Daily volume			USD 1bn	USD 300m			USD 20-50m	USD 40-60m	USD 20-30m	USD 50m

Table 1 (cont)

A summary of Asian FX derivatives markets

	HKD	SGD	KRW	TWD	THB	MYR	INR	IDR	PHP	CNY
NDO										
Restriction			None	Interbank only	None		None	None	None	Interbank only
Liquidity	Market non-existent	Market non-existent	Good	Good	Good	Market non-existent	Average	Average	Average	Average
Trade size			USD 20-50m	USD 30m	USD 20m		USD 5m	USD 5m	USD 5m	USD 10-20m
B/as spread			1 vol	0.7 vol	1 vol		2-4 vol	7 vol	5 vol	1-2 vol
Daily volume			USD 250m	USD 150m	USD 50m		Irregular	Irregular	Irregular	USD 250m

Source: DB Global Markets Research.

China

Foreign exchange policy in China is determined by the People's Bank of China (PBOC) and managed by the State Administration for Foreign Exchange (SAFE). Despite becoming a major player in global commerce, the Chinese economy in aggregate remains relatively closed. However, strong global pressure on its currency will likely lead to a more flexible currency regime in China sooner or later. Although China prefers gradual reform, the officials made it clear that they wish to liberalise the capital account with the goal of developing a sophisticated financial sector and an independent monetary policy. Currently, designated onshore banks and authorised foreign banks are allowed to participate in the FX spot market. For current account items, relevant documentation is required for transactions of over USD 1m cumulative amount, while capital account items require pre-approval from the local SAFE. Only the Bank of China can offer CNY deliverable forwards with the tenor out to 6M. An active market for CNY NDFs exists, however, onshore corporates are not allowed to take part in the market.

Exchange-traded rate futures markets

Appreciating the importance of adequate hedging instruments for dealers and investors, particularly in bear markets, many countries in the region have devoted effort to developing exchange-traded derivatives markets. As of March 2004, six Asian countries have interest rate and/or bond futures markets, namely Hong Kong, Singapore, Korea, Taiwan, Malaysia and India. These efforts have met with varying degrees of success, as described below.

Hong Kong

The three-year HKD bond futures is one of the few that is settled by physical delivery (the other being the 10-year TWD contract). Exchange fund notes (EFNs) issued by the HKMA are reference instruments for the contract. On the Hong Kong Futures Exchange one-month Hibor futures, three-month Hibor futures and three-year EFN futures are traded. The liquidity in each of these contracts has declined in recent years, disappointing expectations, probably due to limited foreign participation and already good liquidity in the OTC derivatives market.

Table 2

Open interest for HKD interest rate futures

	One-month Hibor futures	Three-month Hibor futures	Three-year EFN futures
End-2001	750	58,830	375
End-2002	20	13,806	0
11 March 2004	55	6,172	300

Source: Hong Kong Exchanges and Clearing Limited.

Singapore

Currently, there are two exchange-traded interest rate futures products in Singapore: three-month swap offer rate (SOR) futures and the five-year bond futures. The SOR is an FX forward-implied interest rate calculated from three-month USD/SGD forwards, and an official fixing is provided by the Association of Banks in Singapore. Trading in three-month SOR

futures has been sporadic, and the market has been inactive recently with open interest only at 5,000 contracts in 2002. Possible reasons could be: (i) local corporates are generally cash-rich and do not need to borrow much short-term cash, and/or (ii) with rates trending lower for the past couple of years, hedging borrowing needs has not been a real concern.

The five-year bond futures market was launched in June 2001, but the trading has slowed to nearly nothing. One explanation may be that the investor base in government bonds is skewed towards banks, who have strong credit and ample access to OTC derivatives. In recent years, the basis risk between bonds and swaps has been small, and spreads have been tight. Hedging in the OTC market therefore has provided an efficient, liquid and cost efficient hedge.

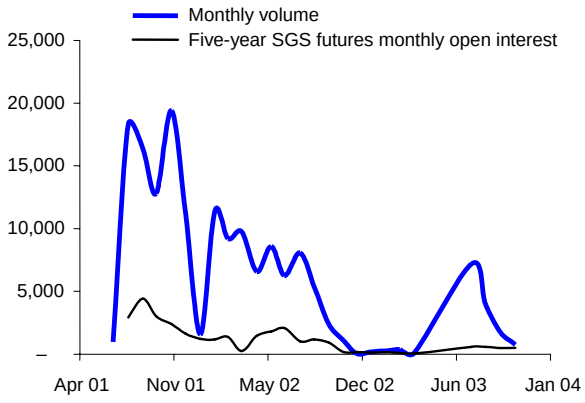
Taiwan

The Taiwan Financial Futures Exchange introduced government bond contracts only in early 2004 but these have not taken off. Whether the reason is the sharp liquidity and accessibility differences between on- and off-the-run bonds, reflecting institutional investors' propensity to hold bonds to maturity, high transaction costs or other factors, is not clear. Neither a narrowing of the maturity range for deliverable securities nor the removal of the penalty for cash settlement has improved liquidity. At the short end of the maturity spectrum, the futures contract based on 30-day commercial paper has also fizzled. In this case, the choice of 30- rather than 90-day paper seems unfortunate in retrospect. The floating leg of interest rate swaps, for instance, is based on 90-day yields.

Malaysia

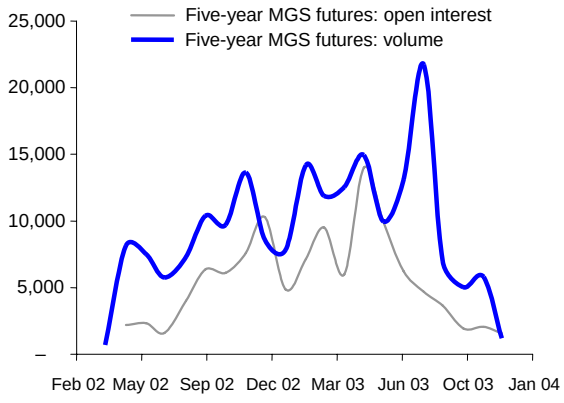
In March 2002, the Malaysian Derivatives Exchange (MDEX) launched Malaysia's first bond futures contract, with the five-year government bond being the underlying security. The contract has similar specifications to the five-year bond futures in Singapore, using a basket of bonds in pricing and being cash settled. Activity in the contract is not great with average daily volume or open interest rarely moving above 1,000 contracts. The use of the futures contract as a hedge for cash bond positions is small. Other futures products in Malaysia are three-year and 10-year bond futures, launched in September 2003, and three-month KLibor futures, launched in March 1996. As in the case of the five-year bond futures, liquidity remains poor.

Singapore five-year bond futures



Source: DB Global Markets Research.

Malaysia five-year bond futures



Sources: Bloomberg; DB Global Markets Research.

Korea

The shining success story among the exchange-traded futures markets is clearly the cash settled three-year Korean Treasury bond (KTB) futures contract. To some degree, the success of the three-year bond futures in Korea could actually be attributable to lack of transparency in the bond market and limited availability of alternative hedging tools. Over time, improved liquidity in the underlying bond market and strong foreign interest have effectively accelerated the growth of the futures market. According to the World Bank,[4] the three-year KTB futures is the sixth most active interest rate futures contract by trading volume. Banks and ITCs are the two main participants in the market with a combined share of 50-60%. Despite the fact that foreigners trade only around 10% of the total volume, they seem to play an important role in catalysing the development of the market. Their activities are closely monitored by domestic players, since they are often viewed as more sophisticated. Foreigners may find it easier to trade futures than cash bonds due to taxation, leverage and liquidity issues. The fact that foreigners' net open interest is as much as 30% of the market compared to less than 1% holding in cash bonds would strengthen the argument. In value terms, foreign net open interest typically ranges between 0.5 to 2.0% of the government bond market.

Table 3

Foreign participation in Korean three-year bond futures

Foreigners' net open interest	Typical market open interest	Value of foreigners' net open interest	Cash bond outstanding	% to cash market
10-30%	60,000 contracts	KRW 0.5-2.0trn	KRW 90trn	0.6-2.2%

Source: Korea Futures Exchange.

Three-month CD futures, one-year MSB futures and five-year KTB futures are also listed on the Korea Futures Exchange (KOFEX), but they are totally inactive at the moment.

India

India launched 10-year bond futures in June 2003. One unique feature is that the settlement price is based on the value of the notional bond, derived from the zero-coupon curve which the National Stock Exchange of India (NSE) publishes every day. To date, this product has been a failure. In fact, in less than three months after the launch, trading in bond futures literally stopped. There may be several ways to explain this. First, the unique settlement price calculation adds complication, and is seen by many investors as an opaque "black box". Moreover, the basis risk between the NSE curve and the cash prices could also be substantial and unpredictable. Finally, restrictions on short selling and requiring financial institutions to use derivatives only for hedging purposes could account for the inactivity of the product. In this case, the absence of speculators may be cheating the market out of badly needed liquidity.

[4] OECD-World Bank Annual Bond Market Forum, 3 June 2003, *Emerging Derivative Markets* presented by Oliver Fratzscher.

Table 4

Indian bond futures trading

	Jun 03	Jul	Aug	Sep	Dec	Feb 04
Number of days	5	23	20	22	22	19
Number of contracts traded	9,768	963	50	0	0	0

Source: National Stock Exchange of India.

Taiwan

The Taiwan Futures Exchange (TAIFEX) launched 10-year bond futures in January 2004. The contract is settled with physical delivery of bonds maturing between seven and 11 years, much like the very successful 10-year Japanese Government bond futures contract. In order to prevent short squeezes on the cheapest and to deliver bonds around the final settlement date, TAIFEX simultaneously opened a Bond Lending Center. TAIFEX hoped that by providing effective hedging tools, the launching of bond futures would attract more foreign funds into the Taiwan bond market. This may eventually take place; however, the initial market reaction was not very enthusiastic. So far, open interest has stayed below 1,000 contracts.

OTC interest rate derivatives[5]

Interest rate swaps

Hong Kong

Based on the most recent survey done by the Hong Kong Monetary Authority (HKMA), interest rate swaps (IRSs) represent the largest segment (over 73%) of interest rate derivative transactions in Hong Kong. With about HKD 9.1bn in daily turnover, the liquidity in the IRS market is far better than the Exchange Fund Note (EFN) market whose daily turnover is about HKD 2.5bn. HKD swap spreads are among the widest in Asia. While EFNs are consistently well supported by strong demand from local banks, HKD swaps are much more sensitive to the volatile risk premium of the currency peg. In addition, the 10-year HKD swap spread tends to be persistently tight, especially right after the issuance of a new 10-year EFN. In order to reduce the interest cost of the 10-year paper in an environment of upward sloping yield curve, the HKMA has consistently swapped the 10-year EFN into a floater after the issuance, creating downward pressure on the 10-year part of the HKD swap curve.

Singapore

Interest rate swaps are also more liquid than government bonds in Singapore. The floating leg of an IRS trade is the swap offer rate (SOR) posted by the Association of Banks in Singapore. (It is an FX-implied rate, in contrast to a Libor-type fixing in typical G7 trades. Many countries in Asia are following this model for developing their own interest rate swap

[5] Cross-currency swap, a hedging instrument for FX risk, is included here due to its similar trading patterns.

market, for lack of a well developed money market.) Corporations are the main hedgers in the swap market, while hedge funds often come in for speculation as well as relative value investments. The MAS has recognised that hedge funds can offer diversification from more traditional funds, and help Singapore develop into an international financial centre. This recognition led to the MAS introducing legislation to allow retail hedge funds to be offered to the local market. Swap spreads have been generally market-directional and more so for long-dated tenors. In other words, swap spreads tend to widen when rates rise and tighten when they fall. There also exists an overnight interest rate swap (OIS) market, with the first trade done in April 2000. In 2002, the government removed the restrictions in the cross-currency swap market. Previously, cross-currency swap could not be traded without economic activity associated with the trade.

Korea

During the first half of 2003, interest rate swaps held 88% share of total OTC interest rate derivatives trades in Korea.[6] However, compared to bond futures, turnover of interest rate swaps is relatively small and volatile. Very recently, daily trading volume has decreased to less than KRW 0.3trn.

Table 5

Daily turnover for KRW bonds, futures and swaps

KRW trillion

	All bonds	Government bonds	Three-year bond futures	Interest rate swaps
2002	5.9	2.0	2.3	0.8
1H 2003	6.6	2.3	2.5	0.9

Sources: Financial Supervisory Service; KoreaBondWeb.

The relative illiquidity of swaps partly stems from the underdeveloped short-term benchmark rates in Korea. Interest rate swaps use the three-month CD rate as the floating rate, but CDs are not liquid in the secondary market. The BoK plans to introduce Libor-type interbank rates in 2H 2004, which will help step up the liquidity of swap trades. IRS trades up to 10 years with a bid/ask spread of 5 bps up to five years and 10 bps for longer tenors.

Trading in OTC derivatives increased in 2001, fuelled by the increased interest in structured products. Since then, in order to enhance returns, investors welcomed structured products whose performance was linked to future market direction or the shape of the yield curve. The most popular products were dual index floaters and inverse floaters, based on constant maturity treasury (CMT) or constant maturity swap (CMS) rates as the reference rates.

The Korean IRS market is highly driven by technicals that may not be reflected in the cash market. The spread between bond yields and swaps (the bond/swap basis) can be quite volatile, as seen in the chart below. Swaps, therefore, can be a relatively risky hedging tool for investors.

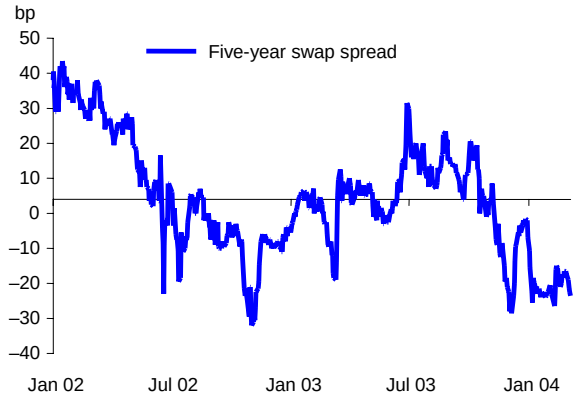
A USD/KRW cross-currency swap (CCS) can be structured out to 10 years, but one to five years are more actively traded tenors. Exporters' USD forward selling and the central bank's

[6] Financial Supervisory Service, *internal data*.

FX intervention are the main drivers in the short end of the cross-currency curve, while external debt issuers and investors generally trade in the long end.

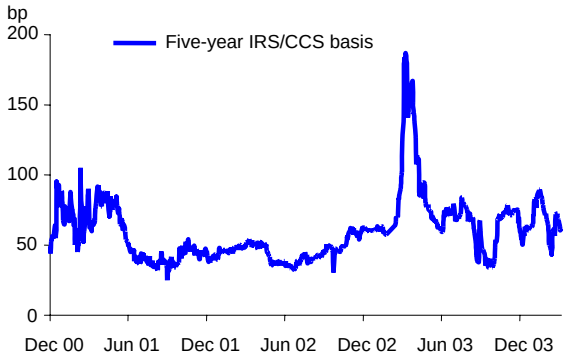
The spread between the CCS and IRS rates (the IRS/CCS basis) has also been volatile in recent years. For the past couple of years, the CCS market has been dominated by domestic investors' KRW-receiving demand to swap their offshore investment into KRW. Many swap dealers who could not hedge their position in the CCS market hedged their position in the relatively more liquid IRS market, running this IRS/CCS basis risk in order to increase market share with asset swapping investors. With continued receiving demand in the CCS market, however, dealers were eventually squeezed out of this basis risk, in late February 2003. As a result of massive unwinding demand, - paying IRS and receiving CCS - five-year IRS/CCS basis had widened to almost 200 bps before it came down to more reasonable levels. Foreigners can participate in the swap market using non-deliverable IRS or CCS and current participation is estimated to be 15%.

Korea five-year swap spread



Source: DB Global Markets Research.

Korea five-year IRS/CCS basis



Source: DB Global Markets Research.

Taiwan

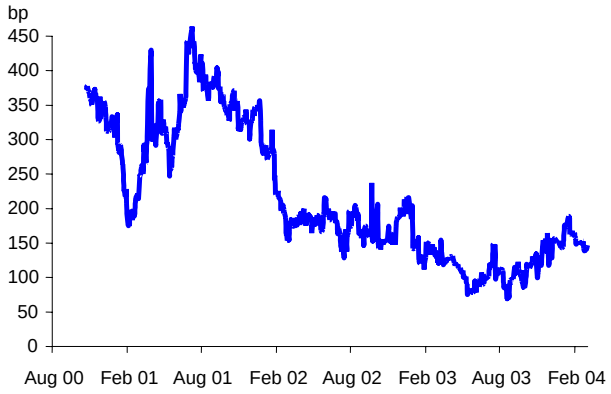
The Taiwan swap market has been affected by some of same dynamics that have affected Korea's. Interest rate swaps trade up to 10 years and the floating rate index is the Taiwan CP rate. Currency swaps are quoted against six-month US Libor and the approval from CBC is required for onshore entities to transact in the onshore CCS market. In recent years, with interest rates declining, investors increased buying offshore debt and swapped cash flows into TWD to achieve their yield targets. These activities, combined with multilateral entities' swapping TWD-denominated debt into major currencies, tended to widen out the IRS/CCS basis. Foreigners can participate in non-deliverable IRS or CCS market where cash flows are net settled in USD, although liquidity is generally low.

Thailand

In Thailand, the dynamics of the bond/swap basis is slightly unusual. First, the onshore IRS market adopts the onshore FX forward-implied yield (THBFIX) as the floating rate index. The basis between onshore CCS and IRS curves is thus minimal, and any cross-currency asset or liability swapping activity, therefore, directly affects the government bond/IRS basis. Since the cross-currency swap uses USD Libor as its floating rate index, the onshore bond/swap basis should theoretically be exactly equal to the Kingdom of Thailand's USD swap spreads. Following this theoretical argument, the THB IRS curve should be below the government bond curve to reflect a positive USD Libor margin for the Kingdom. However, this turns out not to be the case. An asset swap of Thailand's offshore 2007 bond has always offered onshore investors with a yield enhancement opportunity over the onshore market.

This is because the linkage between onshore and offshore capital markets is tightly regulated. Onshore investors have only a limited ability to asset swap USD paper into THB on a case-by-case basis, while foreign entities are currently prohibited from issuing bonds in the onshore market. Only a few state-owned enterprises have been allowed an opportunity to liability swap THB borrowings into USD. With only limited ability to engage in asset/liability arbitrage, the market cannot force a convergence of credit pricing in THB and USD. As long as cross-border restrictions on issuers and investors exist, those who are granted permission will systematically have an opportunity to create cheap THB assets from USD assets, or cheap USD liabilities from THB liabilities. The easing of the regulatory environment has been slow so far.

KoT 2007 swapped into THB minus interpolated onshore government bond yield



Source: DB Global Markets Research.

Malaysia

With strict government regulation of the currency market, a cross-currency swap market does not exist in Malaysia. The only active OTC derivative product in the onshore market is the interest rate swap. Liquidity has improved over the years, but the average trade size is still small at MYR 10m. The most liquid part of the curve is up to three years with a bid/ask spread of 5 bps. Commercial banks, finance companies and merchant banks are the predominant users of the swap market. Given the illiquid nature of the long-term fixed rate assets such as commercial loans, banks with an expectation of higher interest rates are likely to hedge in the swap market rather than to sell such assets outright.

Indonesia

In Indonesia, there is no developed IRS market trading onshore at the moment. However, banks are interested in hedging their liabilities, from fixed to floating or floating to fixed depending on their situation. As a result, some swap trades were done using the IDRFIX[7] and three-month sale offering of the Bank Indonesia Certificate (SBI) rate as floating rate.

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[7] IDR interest rate fixing = {([1+(FWD/SPOT)] x [1+(SIBOR x DAYS/360)] – 1} x 360/DAYS
where FWD = average of the offered side of the FX forward points from banks of each day
SPOT = average of mid spot rate provided by each bank
SIBOR = US interest rate for the respective tenor derived from Sibor
DAYS = number of days for each tenor.

Philippines

No offshore IRS market exists for the Philippines yet, but CCS does trade offshore, albeit with low liquidity. Onshore IRS was launched on 18 August 2003 among six foreign banks (Deutsche Bank, HSBC, Standard Chartered, Citibank, JP Morgan and ING). The market is still very illiquid with trading volume of around PHP 200m a week and a bid/ask spread ranging between 50-70 bps. But by the end of the first half of 2004, at least four local banks are expected to join the market, which should improve the depth of the market. Standard tenors are one to five years and the typical trade size is PHP 50m. The floating leg is the three-month PHIREF or Philippine Interbank Reference Rate. The PHIREF is the implied peso rate derived from all dealt USD/PHP swap and forward interbank transactions.

India

In India, interest rate swaps were first allowed in July 1999. Since then, the OTC derivatives market has grown rapidly. Major hedgers are corporates and financial institutions (FIs). In the past, most hedging came from large borrowers converting fixed debts to floating. Historically, one of the major hurdles in developing the IRS market has been the lack of a liquid money market curve. Due to limited credit appetite and the capital constraints that banks face, the overnight market remains the deepest and the most liquid in the short end of the curve. The overnight rate has also been the most widely accepted benchmark for floating rate bond issues. As a result, overnight index swap (OIS) with the floating rate indexed to the overnight NSE Mumbai interbank offer rate (Mibor) was the most natural market to develop, and today enjoys high liquidity. Another interest rate swap indexed to the three-month or the six-month Mumbai interbank forward offer rate (Mifor) is also highly liquid, in fact far more liquid than OIS with 85% of the total swap trading volume. Although all of the cash flows are settled in INR, Mifor swap effectively becomes a CCS trade since the Mifor is essentially FX implied yield derived from onshore USD/INR forwards.

An increasing number of banks, primary dealers and corporations are actively participating in the two swap markets. Both the OIS and Mifor curves are active up to five years with a bid/ask spread of around 5 bps up to five years and 15-20 bps for longer tenors. Lack of participation from large players, such as public sector banks (PSBs), mutual funds and insurance companies, is often pointed to as the hurdle to further development. In addition, corporations can use OTC derivatives only for hedging purposes while no such restrictions apply in the case of exchange-traded derivatives. One specific case is that corporates cannot cancel and rebook a currency swap.

China

Although offshore non-deliverable CCS trading is not entirely impossible for China, the main issue in the onshore Chinese market is how to develop the underlying bond market. At this point, neither an IRS nor a CCS market exists onshore.

Table 6

A summary of Asian IRS and CCS markets

	HKD	SGD	KRW	TWD	THB	MYR	INR	IDR	PHP	CNY
Interest rate swap										
Floating rate	Hibor	SOR	Three-month CP	Three-month CP	THBFIX	Three-month Klibor	O/n Mibor		Three-month PHIFEF	
Floating legal basis	Qtr-Act/365	Semi-Act/365	Qtr-Act/365	Qtr-Act/365	Semi-Act/365	Qtr-Act/365	Daily-Act/365		Qtr-Act/360	
Fixed legal basis	Qtr-Act/365	Semi-Act/365	Qtr-Act/365	Qtr-Act/365	Semi-Act/365	Qtr-Act/365	Daily-Act/365	Market non-existent	Qtr-Act/360	Market non-existent
Active tenors	One- to 10-year	One- to 10-year	Two- to five-year	Two- to five-year	Two- to five-year	One- to three-year	One- to five-year		One- to five-year	
Trading size	HKD 200m	SGD 10-30m	KRW 10bn	TWD 300m	USD 10m	MYR 10m	INR 250m		PHP 50m	
Bid/ask spread	10bp	2-5bp	5-10bp	5-10bp	10bp	5-15bp	5bp		50-70bp	
Daily volume	HKD 10-15bn	SGD 500-700m	KRW 100-300bn	TWD 1-2bn	USD 15-20m	MYR 25m	INR 4-6bn		PHP 50m	
Cross-currency swap										
Floating rate	Hibor vs Libor	Six-month USD Libor	Six-month USD Libor	Six-month USD Libor	Six-month USD Libor	Market non-existent	Six-month USD Mifor	Market non-existent	Three-month T-bill	Market non-existent
Floating legal basis	Qtr-Act/365 vs Qtr-Act/360	Semi-Act/360	Semi-Act/360	Semi-Act/360	Semi-Act/360		Semi-Act/365		Qtr-Act/360	

Table 6 (cont)

A summary of Asian IRS and CCS markets

	HKD	SGD	KRW	TWD	THB	MYR	INR	IDR	PHP	CNY
Fixed legal basis	na	Semi-Act/ 365	Semi-Act/ 365	Semi-Act/ 365	Semi-Act/ 365		Semi-Act/ 365		Qtr-Act/360	
Active tenors	Two- to 10-year	Two- to 10-year	Two- to five-year	Two- to five-year	Two- to five-year		Two- to five-year		One- to five-year	
Trading size	USD 30m	SGD 20m	USD 10m	USD 10m	USD 10m	Market non-existent	INR 250m		USD 3-5m	Market non-existent
Bid/ask spread	10bp	2-4bp	5-10bp	10bp	10bp		5bp		60-110bp	
Daily volume	USD 30-50m	Volatile	USD 100m	USD 20-30m	USD 15-20m		INR 10-12bn		Volatile	

Source: DB Global Markets Research.

Interest rate options

According to a recent BIS report, interest rate contracts account for 71.8% of the global OTC derivatives market.[8] Particularly, interest rate swaps remain by far the largest single group of products in the OTC derivatives market, representing 56% across market risk categories. In the G10 countries that the BIS report covers, interest rate options are also popular, with 16% share in the total OTC derivatives market. However, except for a few countries such as Hong Kong and Singapore, interest rate options rarely trade in Asia. Among interest rate options products, swaptions are more actively traded in Asia than caps/floors, probably due to a lack of reliable benchmark short-term rates. Hong Kong has the most liquid interest rate options market in the region with average daily trading volume around HKD 500-600m. In Singapore, since the interest rate volatility market has begun to pick up since 2002, rates are quoted regularly in the broker market. The typical daily volume is about SGD 50-100m with foreign participation at about 5-10%. Although the market quotes swaptions with expirations out to five years, three-month and six-month swaptions are the most actively traded. Interest rate options markets also exist for KRW, TWD and THB, but trades are infrequent and volatile. KRW swaptions trade somewhere between two to three times a day to three times per week, and the trade size ranges from KRW 50bn to over KRW 1trn. Average trade size for TWD swaptions is TWD 1bn and trade happens about 10 times a month. For THB, trades are highly infrequent, probably five times a month, and THB 1trn is the average size.[9]

Credit derivatives[10]

Since the mid-1990s, banks have been turning to credit derivatives to more actively manage the concentration and correlation risk inherent in their loan portfolios. But before the Russian default in August 1998, many investors viewed credit derivatives as a curious but highly specialised and exotic corner of the bond market. When suddenly faced with the prospect of deteriorating credits and bond market illiquidity worldwide following Russia's default, investors could see in a very tangible way the attraction of a market where one can buy protection to reduce risk, and sell protection to diversify a dangerously concentrated portfolio.

According to the latest British Bankers Association (BBA) credit derivatives report 2001/2002,[11] the total notional outstanding for credit derivative products stood at USD 1.19trn at the end of 2001. By the end of 2004, the total notional outstanding is expected to increase to USD 4.8trn. Banks are the most important players in this market, capturing 52% of the protection buying and 39% of the protection selling. Among a variety of products, single name credit default swaps (CDSs) continued to be the most popular product with 45% of the market share in 2001. Sovereign single-name CDSs represents the most actively traded credit derivative instrument in emerging markets. There is an active broker market for Asian sovereign CDSs. Two-way pricing is generally available for the most liquid sovereign names in the one to 10 year range. The standard inter-dealer notional trade amount tends to be USD 5m.

Credit derivatives provide many investment and hedging opportunities that are impossible in the cash market. Some general uses of credit derivatives in emerging markets include:

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8 BIS (2003).

9 An estimate from *Prebon Yamane Hong Kong.*

10 Xu and Wilder (2003).

11 BBA publishes its report every two years. The latest available numbers are for the year 2001.

- Given the difficulty in shorting bonds due to underdeveloped repo markets, hedging through credit derivatives is especially attractive for emerging markets investors.
- Credit derivatives allow investors to exploit illiquid points in the yield curve and provide access to points on the yield curve where bullet bonds do not exist in the cash market.
- Investors can sell credit protection and earn a risk premium on an unfunded basis.
- Emerging markets investors can use credit derivatives to exploit relative value opportunities, express a directional view on a particular market, take advantage of changes in the shape and structure of the yield curve and efficiently monetise certain risk characteristics or pricing inefficiencies prevailing in different markets.
- Banks can use credit derivatives to hedge loan portfolio exposure, resulting in a more efficient use of credit lines and economic capital.
- Credit default swap premiums quoted in the dealer market provide a very accurate indicative measure of sovereign credit risk. Debt originators can use default swap pricing as a tool to assist in pricing new bond issues, while potential investors can use default protection premiums as a benchmark for measuring the fair value of new debt issues.

CDSs allow counterparties to buy and sell protection on the credit risk inherent in a bond, loan or guarantee/swap counterparty exposure. A key benefit of CDSs is the ability to create maturity and credit exposure that are unavailable in the cash market. Aside from CDSs, credit-linked notes (CLNs), total return swaps (TRSs) and synthetic collateralised debt obligations (CDOs) are the other major credit derivative products. CLNs can be viewed as a securitised default swap, whose performance depends primarily on the performance of the imbedded default swaps. CLNs appeal to investors who seek customised credit exposures but cannot deal directly in the credit default swap market. TRSs are most widely used in emerging markets where leveraged investors seek to synthetically own and fund high yielding investments without the overhead of investing directly in the underlying assets. In a synthetic CDO, securitisation and credit derivative technologies are combined to provide a more efficient way to structure CDOs, where the reference pool is a portfolio of protection selling positions through CDSs.

Table 7

Emerging market sovereign credit default swaps

Tier 1 **Most liquid**	**Tier 2** **Less liquid**	**Tier 3** **Sporadic activity**
Mexico, Brazil, Colombia, Venezuela, Russia, Turkey, Bulgaria, *Philippines*, *Korea*, *Malaysia*, *Thailand*	Chile, Peru, Panama, Poland, Hungary, Croatia, South Africa, *China*	Ecuador, Qatar, Czech Republic, Israel, Romania, Lithuania, Slovenia, Morocco, Tunisia, Egypt, Slovakia

Source: DB Global Markets Research.

An active credit derivatives market can improve the stability and efficiency of the financial system by its pricing and diversification of credit risk. It also provides tools to securitise credit risk that will help develop the overall bond market. The flip side is the potential moral hazard of the protection buyers and the difficulty of the stakeholders in monitoring the activities. At present, there are no developed local currency credit derivatives markets in Asia.

Conclusion

Growing local bond markets and the rapid accumulation of FX reserves highlight the potential for active intra-regional local currency bond investment in Asia. For this purpose, the availability of standard hedging tools surfaced as a particularly important factor to access each bond market. So far, we have observed a couple of basic patterns in the growth of Asian FX and interest rate derivatives markets.

- FX market liberalisation, although it should be the first step to facilitate cross-border trades, remains incomplete in many countries. Many Asian central banks continue to prefer the accumulation of FX reserves. Although underlying economic conditions are ripe, the signs of further FX deregulation are yet to be seen in some countries. Free capital mobility would be helpful in improving market efficiency by attracting foreigners to the local markets.
- Exchange-traded futures are open in six countries, but except for the three-year bond futures in Korea, liquidity is extremely limited. Two main issues are the lack of a broad investor base (including foreign participation) and the market-unfriendly structure of some products.
- In the OTC market, swap markets are either underdeveloped or inactive in many countries. Reliability in reference rates and regulatory restrictions could be the main reasons.

The choice between diversity and focus should be based on the maturity of each market. While advanced markets like Hong Kong and Singapore may continue to develop a variety of hedging tools, most other Asian countries may want to focus on a small number of basic products. As mentioned before, interest rate options trade frequently only in Hong Kong and Singapore. Although many Asian countries have recently launched an array of derivative products, virtually none of them has good liquidity. Generally, investors would welcome a simple and straightforward product. In those countries, focusing on a few liquid products might be more effective in accelerating market development.

In this regard, the importance of exchange traded markets should not be underestimated, at least for the initial stage. An exchange product can provide players with transparency and an efficient price discovery process, and allow derivatives dealers to hedge their OTC positions more efficiently. In addition, financial instability may arise in the OTC market when shocks such as credit events and sharp movement in underlying asset prices occur. When underlying asset prices change rapidly, the size and configuration of counterparty exposures can become unsustainable and provoke a rapid unwinding of positions. In general, liquidity in vanilla derivatives markets is likely to drive product innovation. Major benefits of exchange-traded derivatives compared to OTC products are:

- no credit exposure with the settlement guaranteed;
- transparency and anonymity;
- lower transaction cost;
- less severe information asymmetry as OTC derivatives activities tend to concentrate in major institutions.

Development of bond and derivatives markets are mutually reinforcing processes. By definition, “derivatives” cannot exist without “underlyings”. The transparency and liquidity of the underlying markets are the fundamental success factors for derivatives markets. A reliable benchmark yield curve should be the main focus for nearly all Asian fixed income markets, but probably with higher priority to China, Indonesia and the Philippines. Pricing of a derivative product is subject to manipulation without solid reference rates, which will subsequently limit the liquidity of the derivative product. Liquid short-term benchmark rates are especially important for pricing swaps.

Finally, the problem of broadening the investor base is a common theme in most Asian derivatives markets. In the case of Singapore and Hong Kong, liquidity in futures markets remains low as there are other liquid OTC derivatives. If somehow more participants become interested in futures, increased liquidity will likely bring more participants into the market in a virtuous circle. In the futures market, the general issue is the lack of ability for market makers or dealers to hedge their position in an efficient manner. For example, in Malaysia, if investors were to sell dealers a futures position, there is no real way for the dealers to hedge their long position by shorting it in the underlying bond market or in the swaps market, which is only liquid out to three-years. Currently, investors in Malaysia are mainly banks and the Employee Provident Fund (EPF), with life insurers and asset managers being small investors. The Malaysian government may need to encourage hedge funds and more asset managers to enter the market just as neighbouring Singapore did. In India, foreign institutional investors (FIIs) are not allowed to trade in interest rate derivatives while they are allowed to trade in equity derivatives. Moreover, large corporates who have the requisite skills to manage or take risk are still subject to strict rules on hedging requirements, which is hampering the improvement in market liquidity. Policy consistency is another important issue. Many Asian governments aggressively introduced exchange-traded derivatives, but they also maintain a variety of policies that discourage the demand for derivatives, such as capital controls, restrictions on short sales and a lack of accounting or legal standards. In order to bring investors into the derivatives market and facilitate sustainable market growth, the authorities should consistently improve market infrastructure, enhance monitoring and supervision systems and provide a fair and reliable regulatory environment.

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