

Asia is adopting electronic commerce and payments at great speed. Virtual banking and Virtual money will appear in Asia. By the year 2000, almost all the major Asian financial centres would have adopted real time gross settlement system and fully automated their cheque and retail payment systems. As financial markets become more sophisticated, Asian payment systems will evolve accordingly. Even though domestic markets may evolve slightly each in their own way, in the 21st century, technology will slowly but surely bring convergence into a global financial market.

Introduction

I am very honoured to be invited by Mr Kevin Kearney to give this presentation to this distinguished and prestigious Conference. There is a major difference between a Western speech and an Asian speech. Western speeches always begin with a joke, Asian speeches begin with an apology. I apologise that other duties prevent me from attending this important Conference in person. You may wish to call this a Virtual speech.

This morning you would have heard Mr Yamaguchi's summary of findings on Electronic Money and the Open Society. The Conference brochure described my presentation as a discussion of the Future of Electronic Commerce from the

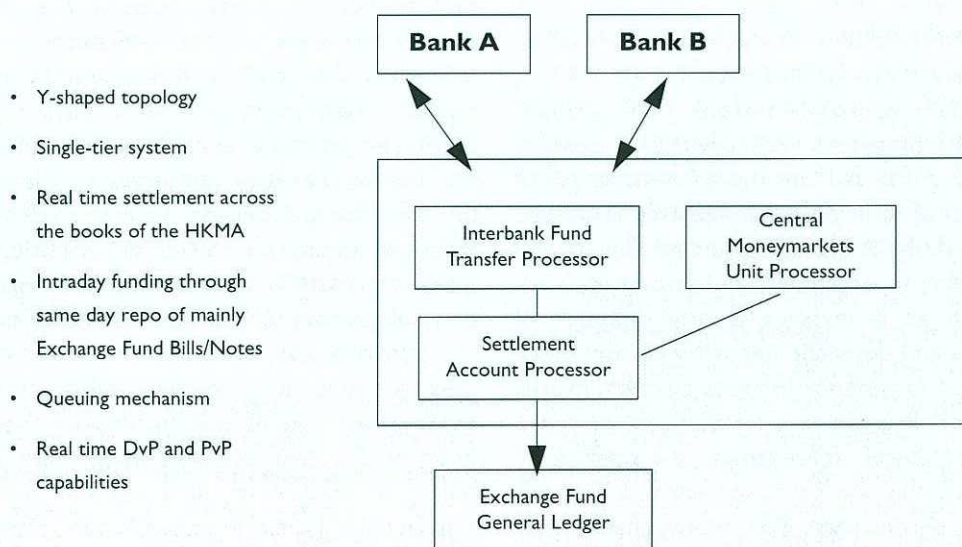
perspective of a central banker whose bank has recently introduced a real time gross settlement (RTGS) system with cross-border links.

I am not an expert on electronic commerce and payments. What I intend to do is to give you a quick overview of payments in Asia (largely confined to East Asia), the potential for electronic payments and some of the issues affecting the development of automated clearing houses (ACHs) in Asia.

RTGS in Hong Kong

First, a little advertising. Hong Kong is the latest advanced economy to install a full-fledged RTGS system in December 1996 (Chart 1). It is one of the most modern and stream-lined systems,

Chart 1
Design of Hong Kong's RTGS System



- Y-shaped topology
- Single-tier system
- Real time settlement across the books of the HKMA
- Intraday funding through same day repo of mainly Exchange Fund Bills/Notes
- Queuing mechanism
- Real time DvP and PVP capabilities

* This is the text of a speech given by Andrew Sheng, Deputy Chief Executive of the Hong Kong Monetary Authority, at the Fifth International Automated Clearing House (ACH) Conference in Edinburgh, Scotland on 21-23 May 1997.

designed with the generous assistance of Peter Allsopp, Christian Vital and Israel Sendrovic, and implemented on time and within budget with the usual Hong Kong efficiency. The RTGS system is run by the Hong Kong Interbank Clearing Ltd (HKICL), jointly owned by the Hong Kong Monetary Authority (HKMA) and the banking community. We see the RTGS system as strategically important for the development and competitiveness of Hong Kong as an international financial centre, and a basic building block of delivery versus payment (DvP) and payment versus payment (PvP), firstly in Hong Kong and then on a cross-border basis. We have already agreed to link our RTGS with the Chinese National Automated Payment Systems, another RTGS system designed with input from largely the same experts, when that goes live in the next two years.

We have also begun to explore the technical and policy issues of linking RTGS systems together with different central banks in the region when their RTGS system goes live in the near future. The aim is to enable PvP to be effected.

Asian Payments

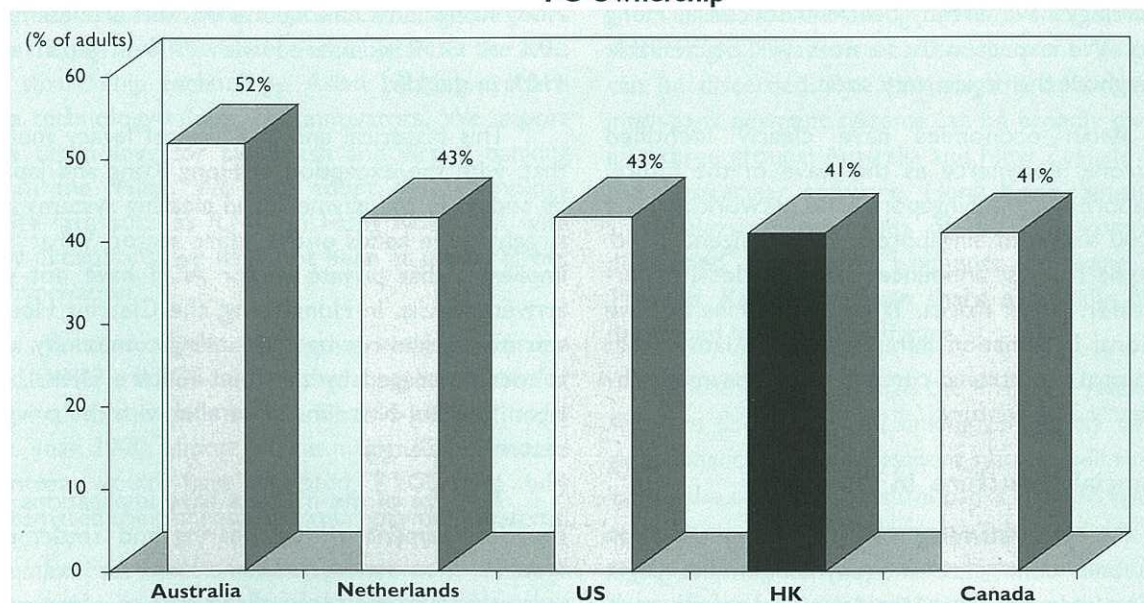
For those of you who are not familiar with East Asia, here's a thumbnail sketch of Asian payments. Asia is still largely a cash and paper-based payments society, with Japan being very

much in the vanguard of using electronic payments. At last count, there are roughly 150,000 automated teller machines (ATMs) in 8 East Asian economies, with about 250 million credit cards, of which 125,000 ATMs and 225 million cards are in Japan. In China, the number of ATMs and credit cards are rising rapidly, but transactions are still essentially cash and paper-based. Hong Kong, for example, clears an average of 540,000 cheques daily valued at US\$5 billion, while electronic payments amount to 12,000 transactions valued at US\$40 billion daily.

Asia is, however, adopting electronic commerce and payments at great speed. Internet banking, electronic money and electronic commerce are being evaluated and considered from Tokyo to Jakarta. Virtual banking and Virtual money will appear in Asia - it is a matter of time. As incomes in Asia rise and Asians become more computer-literate, the potential for electronic commerce is being realised rapidly. According to Dataquest, the Asia Pacific information technology (IT) market between 1995 to 2000 will grow from US\$6.4 bn to US\$22 bn. Asia accounts for 56% of world population, but only one-quarter of total IT spending.

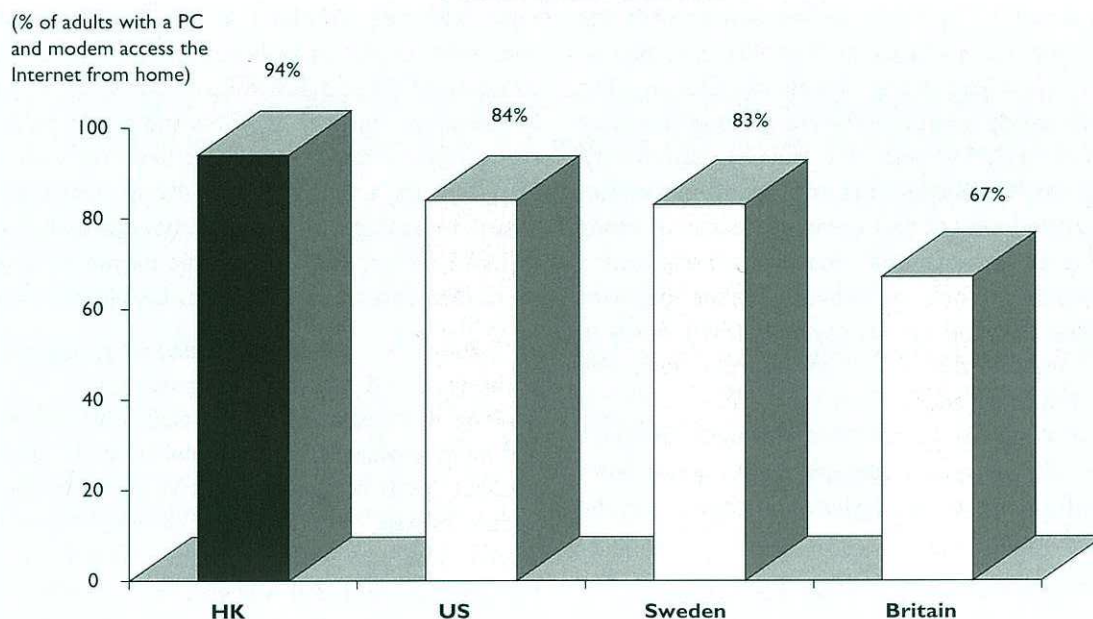
IT penetration in Hong Kong is a good example. 41% of adults in Hong Kong own personal computers (PCs), compared with 52% in US (Chart 2). 94% of Hong Kong adults with PCs

Chart 2
PC Ownership



Source: International Research Institutes, "Business and Consumer Attitudes to the Internet", 1997

Chart 3
Access to the Internet



Source: International Research Institutes, "Business and Consumer Attitudes to the Internet", 1997

and modems access the Internet from home, compared with 84% in the US (Chart 3). Mondex is already on trial in Hong Kong and will be expanded towards the end of this year. Visacash is also live in Hong Kong. Hong Kong has one of the finest telecommunications infrastructures in Asia, with 200,000 kms of fibre optic cabling, linked to 1,500 buildings, and PC banking, Video-on-Demand (VOD) technology have already been introduced in Hong Kong. We expect such services will be available throughout the region very soon.

Asian economies have clearly identified electronic commerce as the wave of the future. Singapore has the Singapore One network and the IT2000 Vision of Singapore as an Intelligent Island. Malaysia has just announced its MultiMedia Super-Corridor. Japan, Korea, Taiwan and China all have National Information Infrastructure initiatives that encompass electronic commerce and payments by the early 21st century.

Financial Structure in Asia

An understanding of the future of Asian electronic commerce and payments must begin with an understanding of the Asian financial structure (Chart 4). Asia has a deep banking system, with

rather uneven level of customer service, but very large by international standards. With high savings rates, China, for example, has bank assets at 114% of GDP, compared with 51% in the US. Asian equity markets are growing in size, with some of the emerging markets, such as Malaysia being as high as 265% of GDP. On the other hand, the bond markets are still nascent and generally illiquid. Hong Kong and China's bond markets are less than 10% of GDP, compared with 74% in Japan and 110% in the US.

This historical and institutional legacy means that, with the exception of Hong Kong and Japan, by and large the payment and clearing systems are largely in the hands of the public sector. What this implies is that private sector ACH have not yet arrived in Asia. In Hong Kong, the Clearing House was owned and run by the banking community, and is today managed by the joint-venture HKICL. In Japan, the BoJ-Net runs in parallel with the private sector run Zengin.

The size of the markets have implications on the development of the clearing and settlement systems. The active stock markets, for example, mean that Asia has some of the more sophisticated equity clearing and settlement systems in the

Chart 4
**Indicators of Financial Market
 Development in Asia**

	Equity Markets as % of GDP		Bond Markets as % of GDP		Bank Assets as % of GDP		M2 as % of GDP	
	1990	1995	1990	1995	1990	1995	1990	1995
HK*	112	211	1	10	936	723	98	118
China	0	6	7	7	105	114	79	105
Korea	44	40	35	42	65	74	38	44
Malaysia	113	265	63	52	96	115	66	93
Philippines	15	81	20	32	45	65	34	50
Singapore	92	177	68	54	165	159	91	86
Thailand	28	86	10	10	78	115	70	80
Memorandum Items:								
Japan	100	72	72	74	164	157	117	114
US	55	95	94	110	54	51	68	59

* HK\$M3

Sources: Emerging Asian Bond Market, World Bank, June 1995; Emerging Stock Markets Factbook 1996, IFC; Washington Asset Management Inc., 1996; IFS Yearbook 1996, IMF; Key Economic Indicators 1996, Asian Development Bank; HKMA.

world. However, the nascent bond markets have resulted in very patchy development of book-entry debt clearing and settlement systems. The liquidity of the Hong Kong debt market is very much attributable to our Central Moneymarkets Unit (CMU) system, initially developed on a simple PC system and now fully integrated into our RTGS system.

Trends in Asian Payments

Let me now turn to future trends in Asian payments. A few general points to start off with. First, again with the exception of Japan in the area of smart chip technology, Asian banking systems are technology-takers, not innovators. We import the technology for cybercash and virtual banking from the West. We may adopt the technology quite fast, such as RTGS in Hong Kong, but with few exceptions, we have not been at the forefront of innovation.

Because of the pioneering work in Europe and the US, RTGS is now the accepted norm for high value payment systems. Chart 5 shows that by the year 2000, almost all the major Asian financial centres would have adopted RTGS and fully automated their cheque and retail payment systems.

Second, with diverse legal systems, different currencies, multiple cultural, historical and market differences, there is no natural inclination for the

evolution of an Asian payment system, such as TARGET in Europe. Asian Monetary Co-operation is somewhere between 10 to 30 years behind that of Europe. There is also no National Automated Clearing House Association (NACHA) equivalent in Asia. Only recently, the Executives' Meeting of East Asia and Pacific Central Banks (EMEAP) group of central banks and monetary authorities have begun to study and prepare the equivalent of the G-10 Red Book on payment services in their respective economies.

Third, each banking system uses different technological platforms, although some patterns can be discerned. For example, the software for inter-bank payment systems can be broadly divided into three groups: Australia and New Zealand uses the Austraclear software, Hong Kong, Singapore and Malaysia use variants of the HongkongBank developed inter-bank payments software and Thailand, Korea and Japan share essentially NTT-developed inter-bank software.

Fourthly, even though the financial systems in Asia are liberalising and linking up rapidly to the global financial system, payment systems will remain largely the purview of central banks. The probability of widespread privatisation of ACHs, as in the case of the US, is not likely to be high. However, the sheer size of the markets must mean that there could be considerable synergy in joint-ventures,

Chart 5
Large-value Interbank Payment Systems

	Owned/operated*	Launch of RTGS	Cheque Clearing
Korea	BOK	1994	90% automated & 10% manual
Thailand	BOT	1995	gradually automated
Hong Kong	HKMA & HKAB	1996	automatic
Singapore	MAS	1997	automatic
New Zealand	RBNZ	1997/8	automatic
China	PBoC	1999	manual/automating
Australia	RBA	1998/9	automatic
Japan	BOJ	2000	automatic
Malaysia	BNM	netting	regional manual/centralised automatic

* BOK - Bank of Korea; BOT - Bank of Thailand; HKAB - Hong Kong Association of Banks; MAS - Monetary Authority of Singapore; RBNZ - Reserve Bank of New Zealand; PBoC - People's Bank of China; RBA - Reserve Bank of Australia; BOJ - Bank of Japan; BNM - Bank Negara Malaysia.

whereby ACHs could provide technical assistance in setting up clearing and settlement systems in a number of markets. I am aware of US ACHs talking of helping the Chinese develop local ACHs.

The Future of DvP and PvP in Asia

Asian payment systems cannot evolve in isolation. The technology, standards, legal framework and market practices are increasingly being formulated in Europe and America, and are being adopted in Asia. As financial markets become more sophisticated, Asian payment systems will evolve accordingly. They will be shaped as much by trends in netting, the work of the Group of Twenty, initiatives by Society for Worldwide Interbank Financial Telecommunication (SWIFT), Electronic Clearing House, Inc. (ECHO), Bolero and the like.

Before I conclude, I wish to make a few simple points. First, technology is moving more and more towards open systems with seamless operations. In back-office terminology, this is called Straight Through Processing (STP). Globalisation and STP combined means that Asian trading and settlement systems must have common standards, protocols and operational practices. As costs and the need to manage risks rise, more and more financial institutions will evolve towards STP.

Second, in order to minimise credit and settlement risks, all markets are moving towards DvP and PvP. Technologically this is a possibility, although legally, politically and operationally there remains considerable difficulties, not only within

borders, but more so, in cross-border terms. Within different domestic markets, there is already active discussions on how to deliver DvP in the equity and debt markets. We are certainly looking at this in Hong Kong. Once the technical issues of domestic DvP are resolved, we expect that cross-border DvP and PvP will come. Since most Asian financial markets are within 1 hour time zone of each other, I would expect that DvP and PvP in Asia could emerge probably faster than most people expect.

Increasingly, a fund manager in Hong Kong, Singapore, Kuala Lumpur or Sydney will want to be able to trade not just European and American bonds and equity, but also Asian currencies, bonds and equities in a seamless manner. Trading rooms and back-offices are already being designed along these lines.

At the retail level, smart cards such as Mondex will minimise cumbersome moneychanging as Asian tourists become much more cosmopolitan. Retail payment systems will be more rigorously linked with high-value wholesale payment systems, of which RTGS forms a major component.

Thirdly, at the central bank level, we are beginning to realise that technology is enabling convergence of standards and market practices, even though we operate in very different markets. This is forcing us to talk to each other more often, so that in a sense, the markets are pushing for greater Asian central bank co-operation, not just at the policy level, but at the operational and

infrastructure level. Because we are at different stages of development, we can learn considerably from each other. As markets develop, Asian central bankers are being more and more market responsive, realising the importance of catching up with the technology.

Finally, I do not wish to give the impression that what is developing in Asia is different from what is happening in Europe and America. The future of electronic commerce and payments will be shaped by the larger markets. Even though domestic markets may evolve slightly each in their own way, I have no doubt that in the 21st century, technology will slowly but surely bring convergence into a global financial market. ☺

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